

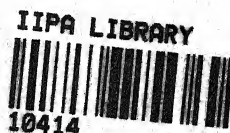
REGIONAL PLANNING AT THE MICRO LEVEL
A STUDY FOR RURAL ELECTRIFICATION
IN BASTAR AND CHANDRAPUR



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IN BASTAR AND CHANDRAPUR

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"Oh my poor little feet, I wonder who will put on your shoes and stockings for you now, dears? I'm sure I shan't be able! I shall be a great deal too far off to trouble myself about you: you must manage the best way you can—but I must be kind to them", thought Alice, "or perhaps they won't walk the way I want to go! Let me see. I'll give them a new pair of boots every Christmas."

Foreword

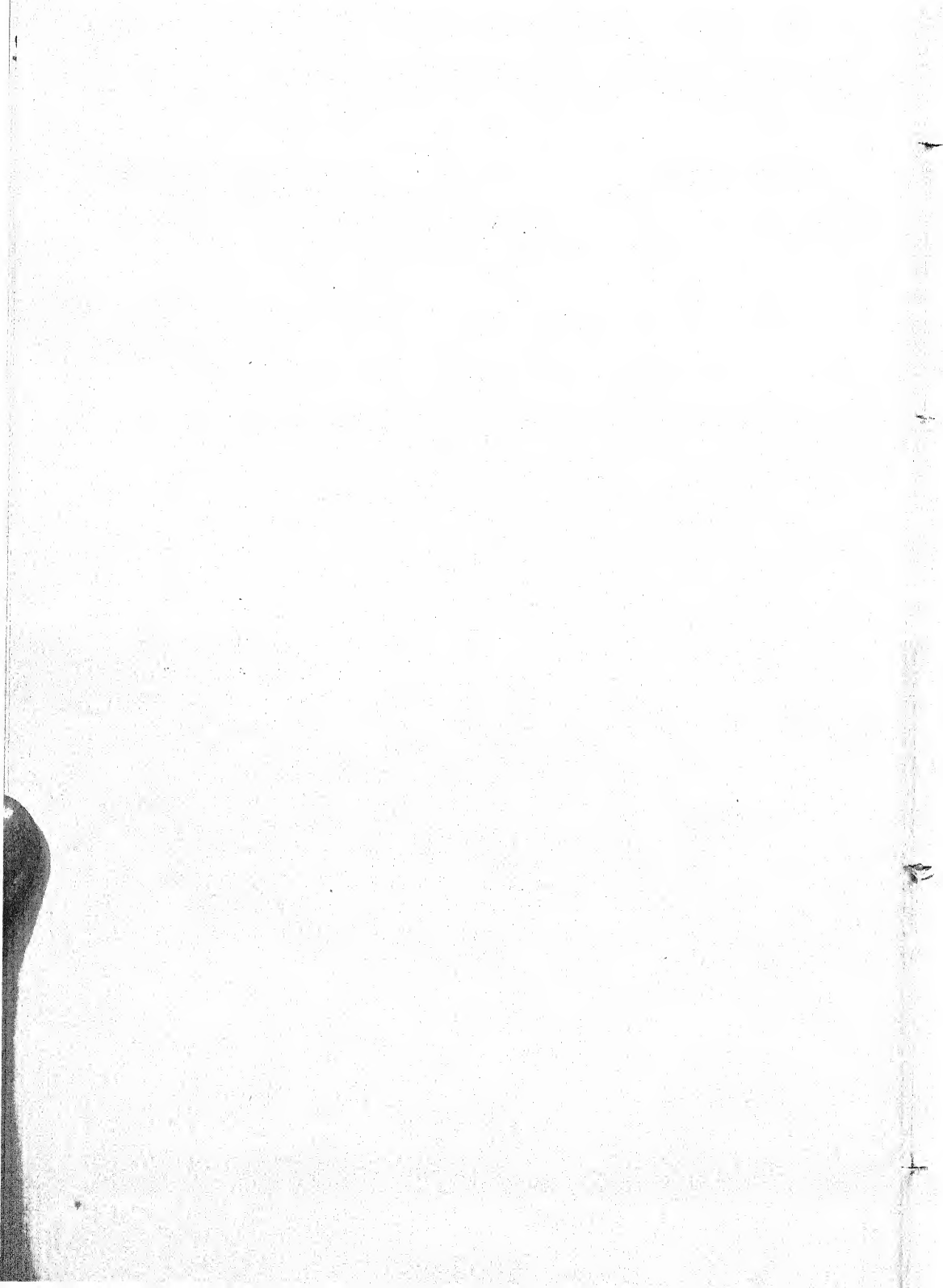
Electrification has been recognised as a key variable for rural development. The investment on rural electrification is being stepped up year by year largely through the Rural Electrification Corporation Programmes. In sanctioning the projects, the Corporation generally keeps in view the overall perspective of regional development. It is, therefore, imperative that for making projections for rural electricity connections, connected load, etc., a perspective plan for regional development is prepared. The objectives of the Five Year Plan at the state and national levels must be kept in view while formulating such a plan.

The present study is an attempt at preparing a rural electrification plan within the framework of comprehensive development for the entire region. The study area comprises two backward districts of India, namely, Bastar and Chandrapur. While the plan itself would be a help in devising strategies for development of the area, the effort of Dr. Girish K. Misra and Dr. Amitabh Kundu has been primarily to develop a general model for forecasting power requirements for a micro-level planning unit. It should help the REC as a guide for making projections of the connections and connected load for various usages, phase out their implementation programme and work different scheme of loan disbursement at the regional or sub-regional level. I am also convinced that the model would be of great help to the planners and researchers in the formulation of a perspective plan, in general, at the micro-level.

NEW DELHI
JULY 1, 1980

T.N. Chaturvedi

(T.N. CHATURVEDI)
Director



Preface

During one of our visits to the study area we sought an interview with a senior level government official in the district of Bastar. When requested to provide certain information he fulfilled his responsibility asking his office to furnish all statistical handbooks to us. The first volume in the set had a quote in bold letters on the first page "...the age of electronics is gone, the age of statistics has come."

Indeed the Age of Statistics has reached the two remote districts of India—Bastar and Chandrapur. The economic and social characteristics are being meticulously identified in various government publications. The statistical departments in the districts use the standard schema supplied from Bhopal, Bombay or Delhi to articulate the complex peculiarities of a tribal economy, its modes of cultivation, nexus of market operations, social behaviour, etc. The set of format of the cultural tables of the Census of India neatly describes the situation that baffles many of our social anthropologists. Everything is neat and unambiguous in the statistical volumes.

This immediately reminds us of the hundreds of tribal men and women we met in the districts, who have been modernised in less than ten years. They have learnt the use of textiles, soap, cosmetics, toothpaste and even soft-drinks. A large number of schools and health centres have come up. The road network is expanding very fast together with the rolling stock comprising mainly government jeeps and trucks taking out the forest produce. In the age of statistics all these informations can be organized into a set of indicators to prove unequivocally 'a process of detribalisation and modernisation' in the districts.

And still how dysfunctional and underdeveloped the society remains. The agrarian practices together with agricultural output remain at the level of the sixties. Cropping pattern changes only to consolidate the premises of a primitive subsistence economy. Despite urbanisation and industrialisation only a few tribals get absorbed in the formal urban-industrial sector. The attitude of the tribal towards the 'outsiders' remains as offensive as it was before ten years, or perhaps more. The indifference of the local people to rural electrification or any other developmental programme continues to be appalling. Among the tribals truth stands naked; while it comes to our civilised world with clothes on. That is what statistics does.

function of the level of development of the region) in this report, for without that there is no empirical rigour and research is unauthentic. We are, however, sceptical not only of our conclusions but are prepared to admit that the report primarily endeavours to work out a methodology. But it is evident despite our misgivings regarding the data base that the region has immense potentialities and that it has waited long enough. It is time that we not only make a perspective plan for providing the basic economic infrastructure like electricity, etc., in the districts; we implement it with all seriousness within a frame of regional development. Or else it may be too late when the three million inhabitants would get divided as per Satre's classification, into 'men' and 'natives' and the latter would talk among themselves without bothering to listen to the remote centres of power.

The present report may not change the situation. May be some of targets are considered too ambitious and unrealistic in view of the resource constraints or the existing administrative set-up. However, no one is capable of ridding oneself of one's subjective illusions. We also join the line of the optimists to suggest "All is lost unless..."

This study owes its form and contents to the many hundred people of the two districts whose cooperation has been the basic motivation. We are thankful to the government officials in the two districts without whose assistance the study could not have been undertaken.

Shri R.N. Haldipur, the former Director of the Indian Institute of Public Administration, initiated the study and provided constant encouragement to the project staff. Shri T.N. Chaturvedi who joined as the Director of the Indian Institute of Public Administration at the last phase of our project showed keen interest in the study and inspired all of us to bring it to its final shape. We are grateful to them.

Shri Harbir Singh Sidhu, Associate Fellow, Centre for the Study of Regional Development, Jawaharlal Nehru University, worked as an expert on agriculture and marketing development. Shri R.K. Khanna, Research Associate in the project took the major load of data compilation and analysis. Messrs. P.K. Saxena, G. Venkatanarayana and H.S. Gupta, Research Associates; and V.K. Dhar and P.A. Kulkarni, Cartographers, helped in the collection and analysis of data and in the preparation of maps. Miss Praveen Bala and Shri C.S. Rana meticulously typed the manuscript.

Thanks are due to Shri N.R. Gopalakrishnan and his team in the Publication Section for providing the necessary assistance in bringing out this book.

The study was sponsored by the Rural Electrification Corporation, New Delhi. Needless to mention that the responsibility for the conclusions and the opinion expressed are entirely those of the authors, and the Rural Electrification Corporation accepts no responsibility for them.

Contents

	PAGE
FOREWORD	VII
PREFACE	IX
LIST OF TABLES	XIII
LIST OF APPENDICES	XIX
LIST OF FIGURES	XXIII
1	
INTRODUCTION	1
2	
ECONOMY OF BASTAR AND CHANDRAPUR	11
3	
CREDIT INFRASTRUCTURE IN BASTAR AND CHANDRAPUR	78
4	
RURAL ELECTRIFICATION IN BASTAR AND CHANDRAPUR	99
5	
RURAL ELECTRIFICATION: THE PLAN FOR 1983	124
6	
STRATEGIES FOR FUTURE DEVELOPMENT	170
APPENDICES	193
INDEX	289

List of Tables

<i>No.</i>	<i>Description</i>	<i>Page</i>
2.1	Area, Population and Villages in Bastar	11
2.2	Percentage Decadal Variation of Population in Bastar	17
2.3	Population Percentage of Scheduled Tribes to Total Population in India, Madhya Pradesh and Bastar	17
2.4	Classification of Population based on Mobility (Male only) in India, Madhya Pradesh and Bastar, 1961	18
2.5	Percentage of Tribal Population in Bastar	18
2.6	Percentage Distribution of Villages over different size classes in India, Madhya Pradesh and Bastar	20
2.7	Participation in Work Force in India, Madhya Pradesh and Bastar	21
2.8	Growth of Irrigation by Sources in Bastar	24
2.9	Number of Irrigation Sources in Bastar	24
2.10	Distribution of Net Irrigated Area (Average of 3 years, 1973-74 to 1975-76) in Bastar and Madhya Pradesh	25
2.11	Area and Production of Important Crops in Bastar	29
2.12	Tehsilwise Percentage of Food & Non-food Cropped Area to Total Cropped Area in Bastar	31
2.13	Tehsilwise Percentage of Gross Sown Area to Net Sown Area in Bastar	31
2.14	High-yielding Varieties Coverage in Bastar	32
2.15	Use of Fertilizers per unit Cropped Area in Bastar (in terms of nutrients)	32
2.16	Seasonwise Consumption of Fertilizers in Bastar (in nutrients form)	33
2.17	Road Length in Bastar, 1961 and 1976-77	40
2.18	Tehsilwise Distribution of Post & Telegraph Facilities in Bastar, 1976-77	42
2.19	Growth of Post & Telegraph Facilities in Bastar	42
2.20	Growth of Medical Facilities in Bastar (1969-70 - 1976-77)	43
2.21	Growth of Educational Institutions in Bastar, 1969-70 to 1976-77	44

<i>No.</i>	<i>Description</i>	<i>Page</i>
2.22	Area, Population and Villages in Chandrapur	50
2.23	Tehsilwise Percentage of Tribal Population in Chandrapur, 1971	50
2.24	Growth of Irrigation in Chandrapur by different sources	53
2.25	Tehsilwise Percentage of Net Irrigated Area in Chandrapur	54
2.26	Distribution of Net Irrigated Area (Average of 3 years, 1973-74 to 1975-76) in Chandrapur and Maharashtra	55
2.27	Ground Water Potential in Chandrapur	57
2.28	Tehsilwise Growth in the Percentage of Gross Sown Area to Net Sown Area in Chandrapur	58
2.29	Tehsilwise Growth in the Percentage of Net Area Cultivated in Chandrapur	59
2.30	Tehsilwise Growth in the Percentage of Food and Non-food Cropped Area to Total Area in Chandrapur	59
2.31	Tehsilwise Growth in the Percentage of Food Cropped Area to Gross Cropped Area in Chandrapur	60
2.32	Tehsilwise Growth in the Percentage of Non-food Cropped Area to Gross Cropped Area in Chandrapur	61
2.33	Production of Important Crops in Chandrapur	62
2.34	Growth in Area under High Yielding/Hybrid Varieties of Different Crops in Chandrapur	62
2.35	Growth of Agricultural Implements in Chandrapur, 1961-71	64
2.36	Growth in Agricultural Wage Rates in Chandrapur	65
2.37	Prices of Major Commodities in Chandrapur	65
2.38	Growth of Poultry per 100 Households in Chandrapur, 1961-72	67
2.39	Distribution of Forest Area in Chandrapur (as on 31st March, 1976)	69
2.40	Average Daily Employment of Workers (Factory) in Chandrapur, 1974	70
2.41	Registered Industrial Small Units in Chandrapur, 1971	71
2.42	Yearwise Growth in the Number of Small Units Registered with the Directorate of Industries in Chandrapur, 1961 to 1971	72
2.43	Increase in Road Mileage (per 100 sq km) in Chandrapur	74
2.44	Growth of Medical Facilities in Chandrapur, 1960-61 to 1975-76	75
2.45	Growth in Literacy (Percentage) in Chandrapur, 1961-71	76
2.46	Percentage Increase in the Number of Students and Institutions, 1960-61 and 1975-76	77
3.1	Rate of Deposits Growth of Commercial Banks in India, Madhya Pradesh and Bastar	79

<i>No.</i>	<i>Description</i>	<i>Page</i>
3.2	Organization and Financial Position of the District Central Cooperative Bank in Bastar	82
3.3	Membership and Deposit Growth of the Bastar District Central Cooperative Bank	82
3.4	Growth Rate of Deposits of Central Cooperative Banks in India, Madhya Pradesh and Bastar	83
3.5	Growth Rate of Short-term and Medium-term Advances through the District Central Cooperative Bank in India, Madhya Pradesh and Bastar	84
3.6	Share Capital and Deposits of the Large Area Multipurpose Cooperative Societies in Bastar	85
3.7	Financial Resources of the District Central Cooperative Bank in Bastar	85
3.8	Advances through the Large Area Multipurpose Societies in Bastar	86
3.9	Growth in Membership, Share Capital and Deposits of District Cooperative Land Development Bank	87
3.10	Disbursement of Loan During the Last Five Years by the District Cooperative Land Development Bank in Bastar	88
3.11	Deposits and Advances Position of the Commercial Banks in Chandrapur as on 30-4-1975	90
3.12	Rate of Growth of Deposits of the Commercial Banks in India, Madhya Pradesh and Chandrapur	91
3.13	Blockwise Branches of District Central Cooperative Bank in Chandrapur, 1977-78	92
3.14	Blockwise Distribution of Primary Agricultural Credit Societies in Chandrapur, 1975-76	93
3.15	Blockwise Branches of Land Development Bank in Chandrapur	94
3.16	Loan Advanced in Chandrapur by the District Cooperative Land Development Bank	95
3.17	Performance of Banks with regard to the Credit Plan in Bastar, 1978	97
4.1	Proposed Power Generating Units in Bastar	100
4.2	Number of Power Sub-stations in Bastar	101
4.3	Progress in HT/LT Lines Route Length (km) in Bastar, 1971-72 to 1976-77	101
4.4	Distribution of Electrified Villages in Different Size Categories in Bastar	103
4.5	Number of Villages Electrified and Agricultural Pump Sets Energized in Bastar upto 1976-77	104
4.6	Growth in Consumption of Electricity in Bastar	105

<i>No.</i>	<i>Description</i>	<i>Page</i>
4.7	Changes in the Pattern of Electricity Sale to LT Consumers in Bastar	105
4.8	Electrified Villages by Different Sources of Financing in Bastar, 1971-72 to 1976-77	106
4.9	Pump Sets Energised in Bastar, 1971-72 to 1976-77	106
4.10	Growth of Small Scale Industries Electrified during 1971-76 by Different Sources of Financing in Bastar	107
4.11	Targets and Achievements of Rural Electrification in Bastar as on 30.9.1978	107
4.12	Tehsilwise Percentage of Villages Electrified to Total Inhabited Villages in Bastar	109
4.13	Progress of Transmission and Distribution Lines in Route Km in Chandrapur	114
4.14	Distribution of Electrified Villages in Different Size Categories in Chandrapur	114
4.15	Tehsilwise Growth of Number of Villages and Agricultural Pump Sets in Chandrapur	116
4.16	Sale of Electricity in Chandrapur	117
4.17	Growth of Per Capita Consumption in Rural Areas in Chandrapur	117
4.18	Growth of Electrified Villages by Different Sources of Financing in Chandrapur	118
4.19	Growth of Pump Sets Energised during 1971-72 to 1976-77 by Different Sources of Financing in Chandrapur	118
4.20	Growth of Small Scale Industries Electrified during 1971-76 by Different Sources of Financing in Chandrapur	119
4.21	Growth of Total Services: Domestic and Commercial in Chandrapur, 1971-76	119
4.22	Loan Advanced during 1971-76 by Different Agencies in Chandrapur	119
4.23	Target and Achievement for Different Type of Services in Chandrapur	120
4.24	Target and Achievement of Rural Electrification in Chandrapur as on 31.3.1977	120
5.1	Development of Number of Connections and Connected Load in Successive Five Years in an Average Village from the Year when its Connected Load became positive in Bastar	127
5.2	Development of Number of Connections and Connected Load in successive five years in an average village from the Date of Electrification in Bastar	128
5.3	Number of Villages Electrified in Bastar	137

<i>No.</i>	<i>Description</i>	<i>Page</i>
5.4	Number of Villages to be Electrified in Bastar	137
5.5	Number of Villages Electrified in Chandrapur	139
5.6	Number of Villages to be Electrified in Chandrapur	139
5.7	Indicators of Development Potential and Potential Villages for Electrification in Bastar	140
5.8	Indicators of Development Potential and Potential Villages for Electrification in Chandrapur	141
5.9	Pump Sets in different years in Bastar and Chandrapur	142
5.10	Progress of Rural Electrification for Agricultural Development in Madhya Pradesh, Maharashtra, Bastar and Chandrapur	143
5.11	Progress of Rural Electrification for Agricultural Development in the Country	143
5.12	Estimated Number of Pump Sets during 1978-83 in Bastar: Total	145
5.13	A Revised Plan for Agricultural Pump Sets during 1978-83 in Bastar: Total	146
5.13(a)	Estimated Number of Pump Sets during 1978-83 in Bastar: Phase I (Revised)	146
5.14	Estimated Number of Pump Sets during 1978-83 in Chandrapur	147
5.15	Connected Load per Agricultural Connection in Bastar (Data for successive years)	148
5.16	Connected Load per Agricultural Connection in Chandrapur	149
5.17	Development of Connected Load in Bastar	150
5.18	Development of Connected Load for Bastar (Phase I)	151
5.19	Development of Connected Load in Chandrapur	151
5.20	Results of Regression Analysis (\hat{b} values only) Electricity for Industrial Use in Bastar	152
5.21	Projected Area and Productivity in Bastar, 1982-83	154
5.22	Distribution of Industrial Units in Bastar	155
5.23	Projected Pattern of Industries in Bastar by 1982-83	157
5.24	Results of Regression Analysis (\hat{b} values only) Electricity for Industrial Use in Chandrapur	158
5.25	Distribution of Industrial Units in Chandrapur	160
5.26	Projected Pattern of Industries in Chandrapur	160
5.27	Average Connected Load for different Industrial Units proposed during 1978-83: Bastar and Chandrapur	161
5.28	Additional Connected Load (KW) for Industries in the Rural Areas of Bastar and Chandrapur	162
5.29	Additional Connections and Connected Load for Domestic and Commercial in the Rural Areas of Bastar	163

<i>No.</i>	<i>Description</i>	<i>Page</i>
5.30	Additional Connections and Connected Load for Domestic and Commercial in the Rural Areas of Chandrapur	164
5.31	Time Profile of Incremental Connections and Connected Load for Street Lighting in the Rural Areas of Bastar	165
5.32	Time Profile of Incremental Connections and Connected Load for Street Lighting in Rural Areas of Chandrapur	165
5.33	Time Profile of Connections and Load for Rural Areas in Bastar (KW)	166
5.34	Time Profile of Connections and Load for the Rural Areas in Chandrapur (KW)	167
5.35	Load per Connection in Bastar and Chandrapur in 1977-78 and 1982-83	168
5.36	Compound Rate of Growth of Connected Load in Various Consumption Categories in Bastar and Chandrapur	168
6.1	Sectoral Strategies of the Plan 1978-83	171
6.2	Blockwise Distribution of Projected Connections and Load in Bastar, 1982-83	184
6.3	Blockwise Distribution of Projected Connections and Load in Chandrapur, 1982-83	186
6.4	Costs of Rural Electrification in Bastar and Chandrapur	188

List of Appendices

<i>No.</i>	<i>Description</i>	<i>Page</i>
1 1	Growth in Sex Ratio (Females per 1000 males)	195
2.1	Tehsilwise Number of Households and Number of Occupied Residential Houses in Bastar, 1961-71	196
2.2	Tehsil/Blockwise Area and Population in Bastar	197
2.3	Tehsilwise/Blockwise Distribution of Villages by Size of Population in Bastar, 1971	198
2.4	Tehsilwise Occupational Pattern in Bastar, 1961-71	200
2.5	Literacy and Occupational Pattern of Scheduled Tribes Population in India, Madhya Pradesh, Maharashtra, Bastar and Chandrapur	202
2.6	Irrigation Potential in Bastar (upto March, 1976)	203
2.7	Blockwise Groundwater Potential in Bastar	204
2.8	Tehsilwise Land Use Pattern in Bastar, 1971	206
2.9	Growth of Cultivable Waste Land, Fallow Land and Net Sown Area in Bastar	207
2.10	Percentage Distribution of Cultivated Areas by Size of Holding in Bastar	208
2.11	Growth in Area under various Crops in Bastar	209
2.12	Levels and Growth of Area, Production and Productivity in India, Madhya Pradesh, Maharashtra, Bastar and Chandrapur	210
2.13	Growth in the Productivity of Major Crops in Bastar	212
2.14	Growth in the Number of Agricultural Machinery and Implements in Bastar	213
2.15	Livestock and Animal Statistics in Bastar	214
2.16	Classification of Forest in Bastar	215
2.17	Growth of Forest Produce in Bastar	218
2.18	Distribution of Health Facilities in Bastar, 1976-77	219
2.19	Blockwise Area and Population in Chandrapur	221
2.20	Blockwise Distribution of Villages by Size of Population in Chandrapur, 1971	222

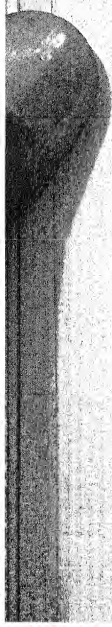
<i>No.</i>	<i>Description</i>	<i>Page</i>
2.21	Tehsilwise Number of Households and Number of Occupied Residential Houses in Chandrapur, 1961-71	223
2.22	Tehsilwise Occupational Pattern in Chandrapur, 1961-71	224
2.23	Blockwise Irrigated Area by different sources in Chandrapur, 1973-74	226
2.24	Growth of Irrigated Area by different sources in Chandrapur	227
2.25	State/District and Talukwise Distribution of Irrigated Area Sourcewise. (Average of three years 1972-73 to 1974-75)	228
2.26	Growth of Net and Gross Irrigated Areas in Chandrapur	229
2.27	Watershedwise Groundwater Potential in Chandrapur	230
2.28	Tehsilwise Land Use Pattern in Chandrapur, 1974-75	237
2.29	Growth in Area under various crops in Chandrapur	238
2.30	Yield of Principal Crops in Chandrapur	240
2.31	Percentage Distribution of Cultivated Area by Size of Holding in Chandrapur	241
2.32	Growth of Livestock Population in Chandrapur 1961 and 1971	242
2.33	Growth of Major Forest Products in Chandrapur	244
2.34	Blockwise Distribution of Medical Facilities in Chandrapur, 1975	246
3.1	Deposits and Advances of Scheduled Commercial Banks (all offices) (as on the last Friday of December)	247
3.2	Distribution of Deposits and Advances of Scheduled Commercial Banks (all offices) over Rural and Urban centres (as on the last Friday of December, 1976)	249
3.3	Sectoral Breakdown of Outstanding Credit of Scheduled Commercial Banks (as on the last Friday of June, 1976)	250
3.4	Deposits and Loans of Central Cooperative Banks (June 1976)	252
3.5	Financial Trends of the District Central Cooperative Bank of Chandrapur	252
3.6	Evaluation of the Credit Plan for Bastar (performance up to December, 1977)	253
3.7	Bankwise Progress in the Implementation of Chandrapur District Credit Plan for the years 1977 and 1978.	254
4.1	Blockwise Growth of Number of Units under different categories of Electricity Consumption in Bastar, 1972-73 to 1976-77	256
4.2	Progress of REC Schemes in Bastar as on September, 1978	258
4.3	REC Schemes sanctioned in Bastar as on March, 1978	260
4.4	Village Electrification in Bastar, 1976-77	261
4.5	REC/MNP Schemes under Operation in Bastar	263

<i>No.</i>	<i>Description</i>	<i>Page</i>
4.6	Blockwise Growth in the Number of Electrified Villages in Bastar (cumulative)	264
4.7	Blockwise Growth in the Number of Electrified Villages in Chandrapur	265
4.8	Blockwise Growth in Number and Connected Load under different categories in Chandrapur	266
4.9	Percentage of Village Electrification to total Inhabited Villages, 1976-77: Chandrapur	268
4.10	Rural Electrification Budget and Expenditure during 1975-77 in Chandrapur	269
4.11	REC Schemes sanctioned in Chandrapur as on March, 1978	270
4.12	Progress of REC Schemes in Chandrapur as on September, 1978	272
4.13	Villages Electrified Blockwise and Schemewise in Chandrapur upto 30.4.1977	274
5.1	Registered Existing Industrial Units in Bastar, upto 31-3-1979	275
5.2	Growth Pattern of Large Scale Industries in Chandrapur, 1978-79 to 1982-83	276
5.3	Growth Pattern of Small Scale Industries in Chandrapur, 1978-79 to 1982-83	277
5.4	Growth Pattern of Medium Scale Industries in Chandrapur 1978-79 to 1982-83	278
5.5	Particulars of Categorywise Connected Load in Chandrapur 1978-79 (KW)	279
5.6	Financial and Physical Targets expected during Sixth Five Year Plan of Chandrapur (1978-83)	280
6.1	Suggested System of Growth Foci for Bastar	282
6.2	Suggested System of Growth Foci for Chandrapur	285



List of Figures

<i>No.</i>	<i>Description</i>	<i>Page</i>
1.1	Location of Bastar and Chandrapur Districts	4
2.1	Bastar District: Administration	13
2.2	Bastar District: Soils	15
2.3	Bastar District: Irrigation	23
2.4	Bastar District: Forest	35
2.5	Bastar District: Road	39
2.6	Chandrapur District: Administration	46
2.7	Chandrapur District: Soils	49
2.8	Chandrapur District: Irrigation	52
2.9	Chandrapur District: Watersheds	56
2.10	Chandrapur District: Forest	68
2.11	Chandrapur District: Road	73
4.1	Bastar District: Electricity	102
4.2	Chandrapur District: Electricity	115
6.1	Bastar District: Central Place Hierarchy	182
6.2	Chandrapur District: Central Place Hierarchy	183



I

Introduction

RURAL ELECTRIFICATION programme aimed at electrifying eventually the whole of rural India is one of the important developmental schemes undertaken by State Governments with assistance from the Central Government in India. The task is, however, gigantic as the problems involved in its implementation are multifarious.

To promote rural electrification in villages, the Government of India established the Rural Electrification Corporation in 1969. The major task of the Corporation is to disburse loans to the State Electricity Boards all over the country for the purpose of rural electrification. Since its inception, the programme had brought significant changes in the economy of rural India. If the performance of the programme and that of the Corporation is analysed *post facto*, there seems to be reasons for satisfaction and optimism. The Corporation has sanctioned up to September 1977 a total number of 1,631 rural electrification schemes. The villages covered work out to 50,349, the figure indicating position up to March, 1978. The number of pump sets energised is 319,759, connections provided for agro-industries, domestic uses and street lighting being 32,434, 85,808 and 220,749 respectively. The total length of high and low tension lines is 113,362 and 133,630 km respectively.

The overall performance of the Rural Electrification Corporation (henceforth called REC) thus seems to be reasonably good although the effectiveness in implementing the schemes varied significantly over the regions. A comparison of the levels of electrification in advanced and backward areas where the schemes have been undertaken brings out some of the major limitations in the implementation. In the backward areas like desert, tribal or hilly tracts, the progress of rural electrification has generally been slow. The number of rural electrification projects submitted by the State Electricity Boards (henceforth called SEBs) to the REC for promoting electrification in backward areas is comparatively small. This can be attributed, although partially to the fact that several projects

in these areas cannot be undertaken as the norms regarding the rate of return, etc., stipulated by the REC are 'very high'. The SEBs thus tend to select a larger number of projects from the advanced areas where quick return on investment is possible. It has been observed, specially in the context of the under-developed regions, that the electricity load increases at a very low rate. Domestic users do not come forward largely because of their low income level and the social and cultural 'backwardness' that accompanies it. Other types of connections particularly for industrial and agricultural usages too develop slowly because of the underdeveloped state of the resource base, lack of economic infrastructure and entrepreneurial skills. The latter, to make the vicious circle complete, can be traced back to the structural underdevelopment of the region and the low income levels of its population.

One of the professed objectives of development planning in India specially since the Fourth Five Year Plan has been the reduction of regional imbalances in the levels of development. Several strategies were formulated to give incentives to develop industry, agriculture and other related sectors in the under-developed regions. To promote agricultural development in backward districts some special schemes were undertaken designed to provide seeds, fertilizers and pesticides to the farmers at subsidized rates, and also to provide loans to enable them to install agricultural pump sets. Similarly, special schemes have been designed to encourage private entrepreneurs to set up industrial units in the poorer regions. The REC too has special schemes for backward areas where the interest charged on loan is lower than the normal and the period admissible for repayment is longer. One cannot, therefore, argue that the backward regions have not been getting any preferential treatment over others which could make up, to some extent, for their comparative cost disadvantage. The unfortunate fact, however, stands out that despite all these efforts the rural electrification programme in backward regions shows only limited success. This calls for an immediate rethinking not only regarding the implementation of these schemes but also regarding operationalisation of some of the professed objectives of the programme.

The officials of the Corporation have often been vexed with the questions like "What more the government and the Corporation should do to promote rural electrification in the backward areas?", "Does the solution to the problem lie in the relaxation of the REC norms?", "Should the government provide more incentives to the people in general or to some vulnerable sections of the society?", "Should the government take the major responsibility in developing the resource base through direct investment?", etc.

The REC sponsored this study evidently in the light of these questions to formulate a perspective plan for the specially backward areas with a

focus on rural electrification. A plan of this nature would help not only the concerned electricity boards to formulate rural electrification schemes but also enable the Corporation to estimate well in advance the requirement of the loan to be sought by SEBs for implementing the schemes. As the plan is to be formulated within a regional frame integrating various sectors of the economy, the study is intended to provide a broad framework of a regional development plan for the two districts as well.

THE STUDY AREA

Two spatially contiguous districts, namely, Bastar and Chandrapur from the States of Madhya Pradesh and Maharashtra were selected by the REC to prepare a regional perspective plan with focus on rural electrification (Fig. 1.1). No specific reason was given for the selection while sponsoring the study. Later, discussions with the officials of the Corporation indicated that the reason for selecting the two districts was simply to have a number of cases which should help in developing a model to forecast the electricity load and requirements for loan for rural electrification in predominantly tribal areas.

An analysis of physical and demographic characteristics of the two districts indicates the broad level of similarity although some of the dissimilarities stand out quite sharply. The two districts fall in what may be broadly called, the North-East Plateau sub-region. Chattisgarh Plain which has Bastar and East Maratha Plain which has Chandrapur fall within this sub-region. Both the districts are the largest in their respective States in terms of area while the population density happens to be very low. The rural densities for Madhya Pradesh and Maharashtra are 79 and 115 per sq km while corresponding figures for Bastar and Chandrapur are 37 and 58, the lowest among the districts in their respective States. In case of Bastar even the density of urban population (726 per sq km) is lowest in Madhya Pradesh, the State figure being 2,378. This is not the case with Chandrapur where urban density is 1,544 per sq km which is more than half of the State figure of 2,555.

The two districts have a very high percentage of tribal population. While Madhya Pradesh and Maharashtra account for about 22 and 8 per cent of the total tribal population in the country, the districts of Bastar and Chandrapur have a share of 12.33 and 7.83 per cent respectively of the tribal population of the State as per 1971 Census. The percentage of tribal to total population in Bastar is 70.47 in the rural areas and 9.85 in urban areas as against the State figures of 23.64 and 2.11. For Chandrapur the figures for rural and urban areas are 15.62 and 0.80 while Maharashtra's figures are 8.14 and 0.82 respectively. The two districts have a significant share of the scheduled caste population as well. The percentages of scheduled caste population are 3.20 and 4.69 for Bastar and

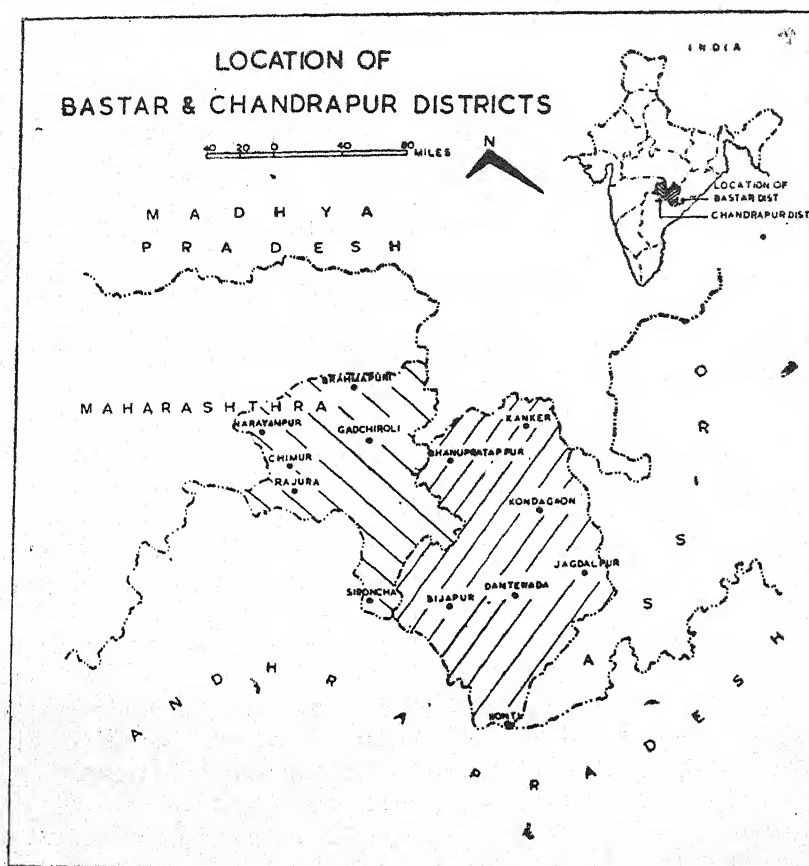


FIG. 1.1

Chandrapur respectively.

The rate of growth of population for both the districts is phenomenal. During sixties the rural population in Bastar has grown by 28 per cent as against 25.7 for Madhya Pradesh and 21.9 for the country. Similarly, the figure for Chandrapur (28.94) is significantly higher than the State figure of 22.22. The disparity in growth rates is more pronounced in case of the growth of urban population. The figure for Bastar comes as high as 110.5 per cent followed by Chandrapur (74.6 %) while the figures for India, Madhya Pradesh and Maharashtra are 38.2, 46.2, and 40.7 respectively. It is thus evident that this tribal region comprising Bastar and Chandrapur is experiencing some kind of population explosion. This, however, cannot be explained in terms of the differential fertility and mortality rates of the tribal and non-tribal population. The growth rate of the tribal population in Bastar during 1961-71 is 22.54 for male and 21.96 for female population in the rural areas. The corresponding figures for Madhya Pradesh are

significantly higher than that, the figures being 25.15 and 24.54 respectively. It is worth noting that the growth rate for the total population for the country as a whole works out to be 25.47 for the male and 23.98 for the female population which is significantly higher than the corresponding figures for the tribal population of Bastar. This suggests that the net natural rate of growth of tribal population during sixties has been lower than the growth rate of population in India. One can, therefore, argue that there has been considerable immigration to the rural areas of Bastar. The same is partly true for Chandrapur as the growth rate of the district population is much higher than that of the tribal population. One thing, however, worth noting is that while the male population has grown at the rate of 27.71 per cent, the female population has lagged behind, the figure being 23.9 in Chandrapur. The corresponding figures for the State of Maharashtra are 22.8 and 22.2. One would, therefore, infer that the immigration of the non-tribal male population into Chandrapur district is substantial. The higher rate of growth of tribal population in urban areas both for male as well as female population as compared to the rural growth rates is indicative of displacement of rural work force and their attempts to seek reabsorption in the urban jobs during 1961-71 in both the districts.

The higher growth rate of tribal population for Madhya Pradesh both for male as well as female population as compared to the corresponding figures for Bastar raises a number of questions. This could be due to substantial immigration of tribal population into Madhya Pradesh from the neighbouring states. The possibility, however, does not stand to empirical verification as the percentage share of Madhya Pradesh to the total scheduled tribe population has declined marginally (although the decline may not be real as the total scheduled tribe population figures as per 1971 Census include some new tribes which were not included in 1961 Census). The second possibility for the relatively higher rate of growth of tribals in the State could be outmigration of tribals from Bastar which cannot be altogether ruled out as the percentage share of Bastar in the total scheduled tribes population in the State has gone down from 12.63 in 1961 to 12.33 in 1971. In addition, it is possible that because of the non-availability of medical facilities, etc., the death rate for the tribals in the district is very high. The registered death rates, however, do not corroborate this proposition. But it must be remembered that the registration error in the case of Bastar is bound to be significant.

The sex ratio for both the districts is very high both for the rural as well as urban areas as may be seen in Appendix 1.1. This is, of course, the characteristic of all tribal societies. However, it is interesting to note that for both the districts as well as for the two States the sex ratio defined as females per thousand males has declined significantly in the rural areas during 1961-71 and this corroborates the trend observed at the national

level. It must also be mentioned that this fall is insignificant in the case of Bastar. The sex ratio for the urban population, however, does not exhibit uniformity. While at the national level as well as in the State of Madhya Pradesh and Maharashtra the sex ratio (in urban areas) has improved, the two districts prove to be major exceptions. This when viewed with reference to the higher rate of growth for the tribal female population in the urban areas (as compared to the tribal male population) appears surprising. This apparent anomaly can partially be explained in terms of massive male non-tribal immigration into the urban areas. Similarly, for Chandrapur which has a lower sex ratio than the State of Maharashtra, the fall can also be explained through the factor of male immigration. The region has therefore to be viewed as being different from other underdeveloped tribal areas in India. It may come at a lower rung in terms of per capita income or other indicators of economic development, but certainly the economy is not a static one. It is an economy in which the basic parameters are changing and responding to massive immigration and other external pressures and also in response to the internal contradictions generated through this process.

OBJECTIVES AND SCOPE

The objectives and scope of the study are as under:

- (i) Projection of the programmes of rural electrification for Bastar and Chandrapur districts upto the end of the Five Year Plan (1982-83). This is to be attempted taking into account REC's approach including pattern and phasing of projects. The projection would evidently be based on the development needs and potentialities of the region, actual development investments by the State and other proposed potential investment in the public sectors, and policies of the Central and State Governments. Among constraints to be considered are financial resources and power availability as broadly projected over the relevant period.
- (ii) Analysis of the implication of the perspective plan for the future tasks of REC particularly on the range and type of REC schemes for rural electrification in the region.

The study would also discuss, in general, the stipulated norms and terms and conditions laid by the REC for project formulation by the State Electricity Boards. Sometimes, just to fulfil these requirements or to get the first instalment released from the Corporation, the SEBs have to manipulate data in their project report. This is more likely to happen in backward areas where the projections regarding the cost and benefit streams for the next 30 or 35 years is anybody's guess. The rate of return as visualised by

the REC being high for the backward areas, the manipulation of the basic data by the project people becomes part of the strategy in the politico-economic process of resource allocation. It is, therefore, necessary to examine most of the REC norms in the context of the backward districts like Bastar and Chandrapur. Besides, to encourage various types of load, *viz.*, domestic, commercial, agricultural and industrial, an attempt will be made to analyse the nature of the bottlenecks within the frame of regional development. The study, therefore, proposes to analyse the district economy in an integrated manner and to determine the potentialities for future development of all the sectors which in turn would help in estimating the projected electricity load in different users' categories.

DATA BASE — PRIMARY AND SECONDARY

The study, by and large, depends on secondary data. However, primary data have been collected to supplement this wherever considered necessary.

These data pertain to different sectors of the economy like industry, agriculture and allied activities including irrigation, forests, social services, etc. Data were also collected mainly from various government departments and developmental agencies located in the two districts. Besides, information was sought from various industrial units, education, health, post and telegraph and transport departments, and the credit agencies.

Data on agriculture and allied services mainly relate to: (i) acreage and productivity of different industrial crops and input used, and (ii) existing and proposed development programmes and policies. As for industries, the data cover their date of establishment, production, labour requirement, quantum of electricity and other inputs used. Data on various socio-economic facilities relate to their exact location in the districts and their norms of input consumption. In case of credit agencies, data were collected on the amount of loan disbursed for promoting agricultural and industrial growth in addition to the information regarding their exact location and area of operation.

Above all, the data were collected from the Madhya Pradesh Electricity Board and Maharashtra Electricity Board on the number of connections and the connected load under different categories of use, *viz.*, domestic/commercial, agricultural pump sets, industries and street lighting. They also supplied data on present power availability in each district and the future capacity. Primary data regarding the number of water points, net irrigated area, cultivated area, population, etc., were collected for about 50 villages in each district for the last 10 years to develop an econometric model for estimating the future connected load under different users' categories. While collecting these cross sectional data two considerations have been kept in mind: (i) the selection of villages

should be random but the number shall be proportional to the total electrified villages in each block of the district; and (ii) the villages selected should preferably be electrified during the period 1968-74 to provide the required number of observations over time. This was done mainly with a view to exclude villages where development load under different categories has not been stabilized. In making projections for the villages to be electrified the trend observed for the village electrification during the past few years has been considered relevant. Also the Five Year Plans and other reports were collected to study the present and future policies to be adopted by the Central and State Governments affecting the regional economy of the two districts.

Discussions were held with government officials of different departments regarding their development policies. Field visits to both electrified and unelectrified villages were made in these two districts to get first hand information regarding the difficulties in getting electricity connections by the users which they may not be able to convey to the government officials.

METHODOLOGY

In Bastar and Chandrapur districts where the total number of inhabited villages is around 3,000 each, it is difficult to study all the villages from the angle of assessing their potential for electrification. The rural electrification schemes according to the stipulated norms by REC are generally prepared for a block or a cluster of villages falling in one or more blocks.

This study, however, does not aim at formulation of rural electrification schemes in detail. It simply provides a broad planning frame to estimate how many such schemes can come up in these districts by 1983 under the given constraints of finance and electric power.

The projections for the study has been made in several stages. The future number of connections and connected load under different users' categories have been obtained through regression analysis. This exercise is based on several alternative linear formulations as indicated below:

- (i) Data on connected load over different years have been used to project the electricity requirement by 1982-83 under various load categories using time as the basic explanatory variable.
- (ii) Econometric models using a number of socio-economic variables have been used for explaining the inter-block and inter-village variations in the connected load and number of connections for the most recent year 1976-77. This has then been used for projection purposes.

Thus we see that the regression models based on cross-sectional data have been constructed at two levels. In the first, the

model has been prepared on the basis of the block level data. In the second case, the village level data for the 50 villages have been used to estimate regression equations separately for the two districts. In this case some of the variables used in the first model had to be dropped because of the non-availability of data. As has been stated earlier, the secondary data relating to cultivated area, net area sown, number of water points, etc., have been collected through primary surveys in case of each of the selected villages to build up this predictive model.

- (iii) A time-series profile of the number of connections and connected load has been obtained for electrified villages for five years. This trend has been used for making projection of load and connections for an average village in each block. This average figure when multiplied by the number of villages to be electrified gives the relevant number of connection or connected load for each block.
- (iv) For assessing the potential of industries based on agricultural produce, first the production of the relevant crops has been estimated for 1983. After deducting the projected demand for final consumption the amount available for intermediate use has been worked out which will determine the upper limit of the capacity for the agro-based industries assuming no export (from the district) of raw material. Similarly, surplus (for intermediate use) for forest-based and other industries has been estimated. These projections ultimately help in estimating the total power requirements for industrial sector in the districts. As the distribution of future industrial units within the districts are important in the formulation of rural electrification schemes, the important places and their hierarchy have been found out using simple statistical methods of aggregation.
- (v) Input coefficients of power for various industrial units have been used to estimate the requirement for electricity based on the number of units of different industries, i.e., commodity groups.

The alternative projections for electricity consumption, connection, etc. for various usages based on different methods enable us to examine the validity of the results and discuss the relevance of alternative assumptions. In case of significant difference between the different projections, further analysis has been carried out to identify the reason for such anomalies, and attempt has been made to get more realistic set of projections.

These projections have then been cross-examined in terms of the availability of crucial resources which define the upper limit to capacity. For instance, there is a limit to the ground water potential in different parts of the districts. Any realistic projection for the area under different crops

and productivity of land has to be set within the constraint of ground water potential. While projecting the production of different agricultural crops essential for the agro-industries it is necessary to ensure that the area under different crops and the per hectare productivity etc., are not taken to be higher than the upper limit imposed by the soil and climatic conditions. This would in turn provide a cross check on the number of industrial units and their production capacity.

Another important consideration in making these projections would be the future strategy of development pursued by the Government. The provision of subsidy for promoting agriculture and industries in a district by the State Government has a vital role to play in this regard. The Rural Electrification schemes can succeed only when such measures are taken in a well-coordinated fashion.

A SHORT PLAN OF THE WORK

Chapter 1 of which this section is a part, introduces the basic physical and demographic characteristics of the region, discusses data base, objectives and methodology of the study, as may be seen above. Chapter 2 makes an attempt to analyse the structure of the economy of Bastar and Chandrapur while explaining the impact of the various government strategies on the district economies mainly in the post independence period. It also examines the future policy of State Governments to develop the various sectors of economy in the region. Chapter 3 is devoted to the examination of credit infrastructure available in the districts of Bastar and Chandrapur respectively, and its capability to sustain financial requirements of various developmental activities. It studies the trend in the total credit disbursement, its sectoral and regional breakdowns, etc. The Chapter ends by evaluating the future plans of some of these institutions and their adequacies in view of the development effort proposed for the region.

In Chapter 4, the past performance and achievements of rural electrification programme have been critically reviewed in the two districts. Besides, an attempt has been made to estimate the total availability of power within the districts in the next five years. In Chapter 5, an attempt is made to work out a broad frame of regional development for the two districts with a focus on rural electrification. Projections of requirements for connected load, connections and also the loans to be financed by the Rural Electrification are the subjects covered here. In the last Chapter, general results of the study with focus on the role of REC have been presented.

Economy of Bastar and Chandrapur

BASTAR

THE DISTRICT Bastar situated in the north-eastern corner of Madhya Pradesh is surrounded by Andhra Pradesh and Orissa in the south, Maharashtra in the west and Durg and Raipur, the two relatively industrialised districts of Madhya Pradesh in the north. The district, however, happens to be one of the most backward districts of the country. Though not as a logical corollary, this happens to be the most sparsely populated district. The area of the district as per the 1971 Census estimate is 39,060 sq km of which only 78 sq km is urban shared by three towns, namely, Jagdalpur, Kanker and Kirandul (Table 2.1).

TABLE 2.1 AREA, POPULATION AND VILLAGES IN BASTAR

<i>District/ tehsil</i>	<i>Area km² (as per village records)</i>	<i>Density of popu- lation</i>	<i>Percentage of villages uninhabi- ted to in- habited villages</i>	<i>Inhabited villages per 100 sq km</i>	<i>No. of towns</i>	<i>Population (1971)</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bastar District	39,060.0*	39	8.69	16.0	3	15,15,956
Jagdalpur	4,091.3	103	2.87	14.6	1	4,22,380
Dantewada	2,203.1	78	3.02	10.6	1	1,72,174
Konta	1,196.9	110	3.86	26.4	—	1,32,151
Bijapur	3,697.4	32	39.96	13.9	—	1,17,650
Kondagaon	3,681.3	67	0.94	14.4	—	2,48,242
Narayanpur	3,140.0	52	6.86	19.9	—	1,62,529
Kanker	1,750.6	107	0.95	17.9	1	1,86,126
Bhanupratappur	1,371.7	55	0.00	18.4	—	74,704

SOURCE: *Census of India, 1971* (Madhya Pradesh).

*The tehsil level breakdown of the area figures does not include 17927.7 km² of forest area.

The district comprises eight tehsils, viz., Jagdalpur, Dantewada, Konta, Bijapur, Kondagaon, Narayanpur, Kanker and Bhanupratappur. In all there are 32 blocks of which 28 have been declared as Tribal Development Blocks and four as Community Development Blocks (Fig. 2.1). There are 3,683 villages in the district of which 8 per cent are uninhabited.

PHYSIOGRAPHY

The success of rural electrification programme to a large extent depends on the nature of economic activities which in turn is determined to a large extent by terrain and accessibility of the region. Keeping in view the local relief, etc., the district may be divided into five physiographic divisions namely: (a) Kotri-Mahanadi plain, (b) Abujhmar hills, (c) North-Eastern plateau, (d) Southern plateau, and (e) Godavari-Sabri lowlands. An understanding of the topography and other physical characteristics of these regions is essential in the formulation of its development plan in general and in estimating the costs of providing electricity to the rural areas in particular. The major characteristics of these regions have been discussed briefly.

The Kotri-Mahanadi plain stretches from the northern boundary of the district, southwards for about 24 km comprising roughly the Kanker and Bhanupratappur tehsils and the northern part of Narayanpur tehsil. It is bounded on the south by the Abujhmar hills. The whole of this plain presents a characteristic rounded topography. The general elevation of the plain is 152 to 457 metres above the sea level.

The Abujhmar hilly region is conspicuous because it comprises ridges and deep valleys, the local relief being about 152 to 427 metres. The large part of this area is rugged and dissected by numerous streams.

The North-Eastern plateau lies east and south-east of the Abujhmar hilly region and extends to the eastern boundary of the district. The bulk of the land is characterised by the rounded topography.

The Southern plateau crosses Dantewada and north Bijapur tehsils. It comprises Bailadilla hills, Tikanpalli hills and the Dantewada region. The Bailadilla hills run along the western boundary at Dantewada tehsil and attain about 1,219 metres elevation but are generally about 914 metres high. *The Tikanpalli hills* occupy the southern corner of the southern plateau. They are of a more recent origin as compared to the Bailadilla hills. The *Dantewada plain* is formed by the denudation of the northern part of the Dantewada plateau by the Dantewada river which is a tributary of the Indravati.

The Godavari-Sabri lowlands extends from the southern boundary of the district to the base of the southern plateau. It possesses a rounded topography formed through denudation of the southern granites and gneisses by the numerous tributaries and sub-tributaries of the Godavari and Sabri

ivers which flow in the tehsil of Konta and southern Bijapur.

The difficult terrain which has preserved the identity of tribes and emphasized their isolation acts as a deterrent and chief obstacle to development plans in Bastar, particularly the construction of transmission lines and installation of transformers for rural electrification.

The physiographic differences within Bastar district have led to differences in human concentration as well as their economic activities. It is worth noting that most farm lands occur in the lowlands while forests are

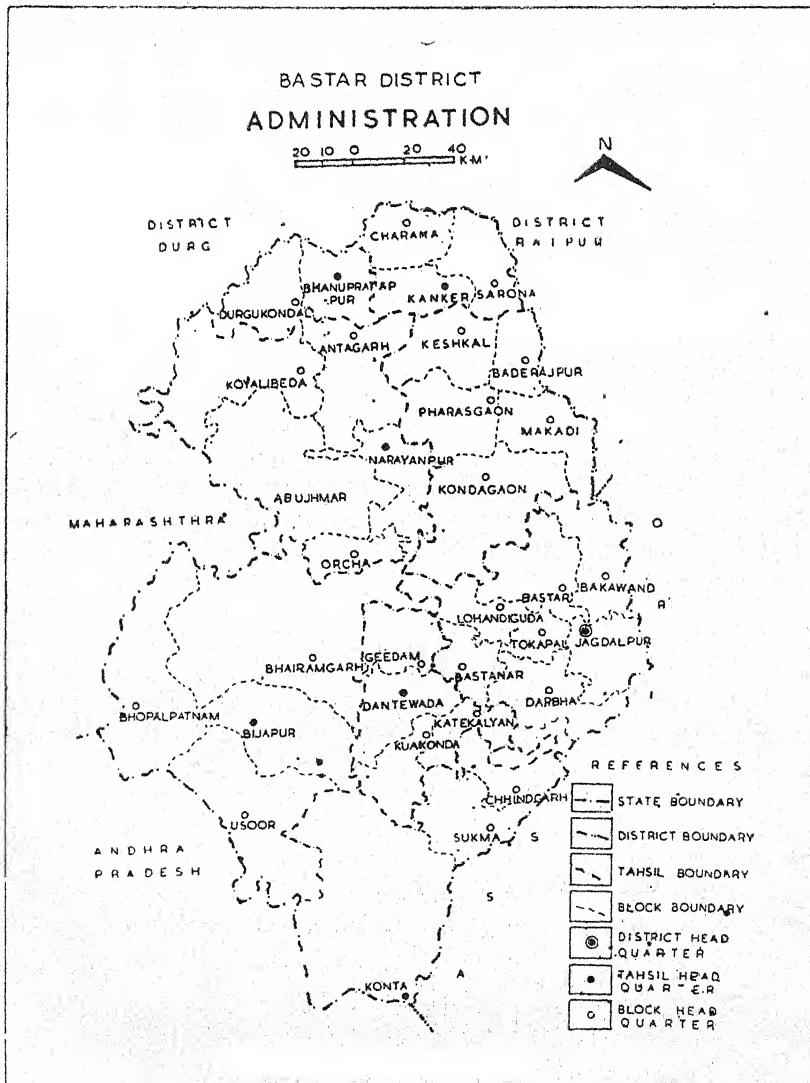


FIG. 2.1

retained in the uplands. There are exceptions to the general rule as we encounter cultivation in some of the upland regions despite their rugged relief. The important case is that of the Abujhmar hills where cultivation is done on the hilly slopes.

The uneven surface characterising most of Bastar is favourable for tank irrigation and is particularly unsuited for large scale canal irrigation. Hence we find that canal irrigation is almost absent here. Well irrigation is much less developed than tank irrigation because where such irrigation is needed, *viz.*, in the house-gardens situated on the uplands, the cost of digging a well in hard rock is prohibitive. In the valleys, on the other hand, wells are very easy to dig but the water table is almost at the ground level. Wells are generally not used for irrigation in the valleys also because rice which is the major crop in the region is essentially a monsoon crop. Where irrigation is required throughout the year as in sugarcane cultivation, a common method is to dam the natural drainage channels at places and thus form pools from which water can be lifted by buckets into fields of the adjoining area.

CLIMATE

From the climatic point of view, the district is characterised by hot and humid climate. The average temperature varies from 30° to 45°C. The rainfall occurs between June and September and ranges between 1000-2000 mm with heavier rains in Kondagaon and Jagdalpur tehsils. The district remains dry during December-February. The upland receives more rainfall during summer than the plains and valleys. Since the annual precipitation is fairly high, floods are more serious hazards for the district to agriculture than droughts.

SOIL CONDITION

A large part of the district consists of red soils. The uplands have light coloured, thin, gravelly and poor soil while the valleys have dark, deep, finer and more fertile soils. Fig. 2.2. shows that in the north-east corner of Kanker and Bhanupratappur tehsils red and yellow soils prevail while in south-east belt of Jagdalpur and Konta, one finds red loamy soil. The rest of the district comprises red sandy soils with patches of skeletal and lateritic soils in between. These soils are generally poor in nitrogen, moderate in phosphorous, sometimes high in potash and rich in forest humus. Alkali occurs sometimes.

DRAINAGE

The drainage system of Bastar district comprises the rivers of Sabri, Godavari, Indravati and Mahanadi. Sabri is on the south-east border,

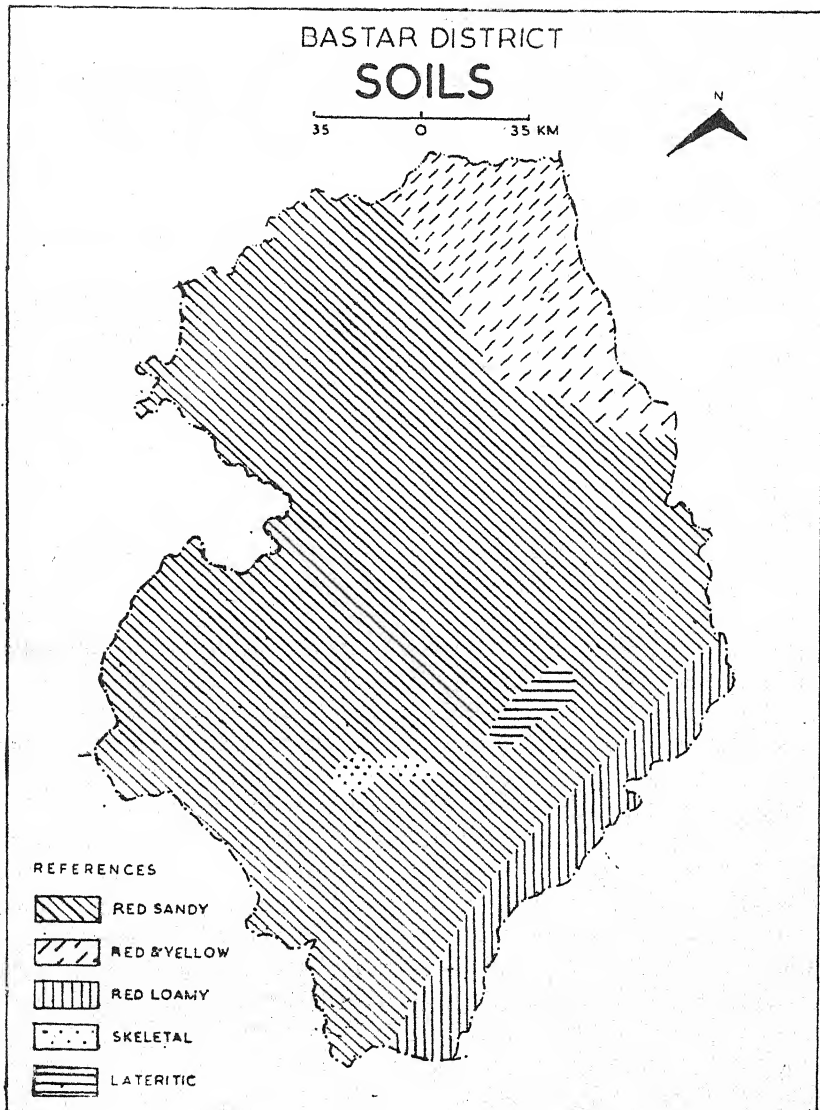


FIG. 2.2

Godavari on the south-west border, Indravati right in the middle joining Godavari in the west, and Mahanadi in the north-east corner of the district. The major tributaries of Sabri are Sileru, Kanker, Malengar and Machkund, those of Indravati are Kotari, Nibra, Bandia, Boardhig and Narangi, those of Godavari are Talparu, Chintagu and Gubbu, and those of Mahanadi are Dudh, Halkul, Turi, Chinnar and Sendar.

PEOPLE

According to 1971 Census, the population of Bastar district is 15,15,956 of which about 96.3 per cent live in the rural areas. The sex ratio for the district works out as 997 female per 1000 males which is significantly higher than the national or the State figure. It is remarkable that the male and female ratio has remained almost stable for the last 70 years although for the country as a whole the female population in relative terms has gone down significantly.

There has been 269.90 per cent variation of the population during the period 1901 to 1971 (Table 2.2) as against the national figure of 129.9 per cent only. It may be noted that the growth rate of the rural population as well as that of total population is significantly higher than the corresponding figures of the country right from 1901. One can, therefore, argue that while the problems of high natural rate of growth of population is common for all the regions of the country, Bastar has to cope with the problems of growth due to high birth rate and high rate of immigration.

It must also be kept in mind that Bastar having vast areas with very low density is likely to experience this rate of population growth for sometime to come. One can argue that despite the high rate of population growth as mentioned above, the rural density of Bastar remains much lower compared to the all-India figure, and that with adequate investment in developing the resources of the district, it should be possible to absorb this growth rate of population in an economically viable manner. (Table 2.3).

An analysis of the migration pattern gives very interesting insight into the inter-district as well as intra-district movement pattern. In Bastar district 76.8 per cent of the rural male population can be termed as immobile, the latter indicating population enumerated at the place of birth in 1961. The corresponding all-India figure or that of Madhya Pradesh is significantly higher than this, the two values being 84.5 and 80.6 respectively (Table 2.4). There are two possible explanations for this: (i) the mobility of tribals is high due to the shifting cultivation and (ii) the tribals are displaced from their homeland with the infiltration of the local people. Percentage of male population moving within the district, therefore, comes out to be very high for Bastar. The most important feature, however, is that the ratio of male migrants from outside the state to those coming from within the state is phenomenally high for Bastar. The figure for Bastar works out to 172.4 while the State level and all-India figures are 89.1 and 71.1 respectively.

An inter-tehsil analysis of the time profile of households and occupied residential houses in 1961 and 1971 gives an insight into the pattern of population growth. It is observed that in general the number of households per 100 residential houses has increased both in the rural as

TABLE 2.2 PERCENTAGE DECADAL VARIATION OF POPULATION IN BASTAR

Years	Total population		Rural population	
	Bastar	India	Bastar	India
(1)	(2)	(3)	(4)	(5)
1901-1971	+269.60	+129.93	+263.47	+106.56
1961-1971	+ 29.85	+ 24.80	+ 27.94	+ 21.86
1951-1961	+ 27.77	+ 21.51	+ 27.44	+ 20.64
1941-1951	+ 16.64	+ 13.31	+ 16.71	+ 8.79
1931-1941	+ 18.44	+ 14.22	+ 18.82	+ 11.81
1921-1931	+ 12.13	+ 11.00	+ 10.36	+ 9.98
1911-1921	+ 5.15	— 0.31	+ 4.34	— 1.28
1901-1911	+ 36.65	+ 5.75	+ 39.60	+ 6.40

SOURCE: *Census of India*, 1971, Madhya Pradesh, p.152. General Population Tables Part II-A.

TABLE 2.3 POPULATION PERCENTAGE OF SCHEDULED TRIBES TO TOTAL POPULATION IN INDIA, MADHYA PRADESH AND BASTAR

	Rural		Urban		Growth rate of total population	
	1961	1971	1961	1971	Rural	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
India	8.16	8.36	0.98	1.19	21.9	38.23
Madhya Pradesh	23.80	23.64	1.62	2.11	25.68	46.62
Bastar	73.75	70.47	9.42	9.85	27.94	110.54

well as urban areas. For tehsils like Jagdalpur and Kanker having a town each, the increase in the ratio of households to houses both in rural and urban areas has been phenomenal—much more than the State level figures. One can only infer from this that the increase in the number of houses does not commensurate with the increase in households, thereby creating housing problems in relatively 'urbanised' tehsils (Appendix 2.1) of the district.

The main tribes inhabiting the district are: Gond, Halba, Bhatra,

TABLE 2.4 CLASSIFICATION OF POPULATION BASED ON MOBILITY
(MALE ONLY) IN INDIA, MADHYA PRADESH AND BASTAR, 1961

	<i>Percentage of immobile popula- tion</i>	<i>Percentage of population moving within the district</i>	<i>Ratio of migrants from within to out- side</i>
	(1)	(2)	(3)
India	(Rural) 84.53 (Urban) 56.26	9.97	71.09
Madhya Pradesh	(Rural) 80.59 (Urban) 55.64	13.36	89.13
Bastar District	(Rural) 76.80 (Urban) 46.94	14.00	172.45

Dhuriva, Praja, etc. The tehsilwise percentage of tribal population to the total population is given as under:

TABLE 2.5 PERCENTAGE OF TRIBAL POPULATION IN BASTAR

<i>Name of tehsil</i>	<i>Percentage of tribal population</i>
(1)	(2)
Jagdalspur	86.9
Dantewada	85.6
Konta	79.7
Bijapur	73.8
Kondagaon	72.0
Narayanpur	69.9
Kanker	65.6
Bhanupratappur	55.4
District	68.20

It is clear from Table 2.5 that Kanker has got the highest percentage of tribal population whereas it is lowest in Narayanpur tehsil. The blockwise population alongwith its other details, i.e., total population, the percentage of scheduled castes and scheduled tribes to the total population, etc., are given in Appendix 2.2. It is worth noting that Narayanpur tehsil

though has the lowest percentage of tribals, presents wide variation in blockwise distribution of tribals. It is interesting to note that its two blocks, namely, Koilibanda (29.46) and Abujhmar (96.29) possess the lowest and the highest percentage of tribals to the total population in the district. This is evidently because of the resettlement of refugee population in Koilibanda block. The percentage is low also in case of Jagdalpur and Kanker blocks, the figures being 46 and 55 per cent. This is largely due to the location of Jagdalpur and Kanker towns where the non-tribal population is substantially higher than the tribals. A fourth block where the influx of non-tribal population is very high is Charama, located at the district border. This can be explained in terms of its exposure to the Raipur and Durg districts and the National Highway connecting Jagdalpur to Raipur passing through it. There does not seem to be any significant relationship in the spatial pattern of the distribution of scheduled castes and scheduled tribes population in the district. The only point one may mention is that the inter-block variation in the percentage of scheduled caste population is much less significant as compared to that of the scheduled tribes population implying thereby that scheduled caste population meagre as it is, has been widely distributed within the district.

The blockwise classification of inhabited revenue villages according to the size of population is given in Appendix 2.3. It may be observed that about 72 per cent of the total inhabited villages are in the size group of below 500 while another 19 per cent fall in the size group 500-1000. This compares very unfavourably with the National average or that of Madhya Pradesh as the corresponding figures for percentage of villages below the population of 500 are 55.34 and 66.35 respectively (Table 2.6). It must be mentioned that villages below the size of 500 are considered to be non-viable for the provision of basic economic infrastructure in the context of Central India. During 1961-71 the villages in this size class (0-200) have significantly fallen for India as well as for Madhya Pradesh. In case of Bastar too this decline is in evidence although the fall is much less. This would imply that purely in terms of size distribution of rural settlements Bastar poses special problems which ought to be given due consideration in any programme of rural development. The percentage of villages in the size class of 2,000 and above is much lower in case of Madhya Pradesh, i.e., 1.95 as compared to the National figure of 7.35. The figure for Bastar is still lower which works out to 1.66 suggesting thereby that medium and large size villages with a higher development potential are very few. There are only five villages in the district where population is above 5,000 persons. These villages are in Darbha, Kuakonda, Kondagaon, Narayanpur and Kanker blocks,

TABLE 2.6 PERCENTAGE DISTRIBUTION OF VILLAGES OVER DIFFERENT SIZE CLASSES IN INDIA, MADHYA PRADESH AND BASTAR

		Population size					
		Below 500		600-1000		2000+	
Year		Village	Popula- tion	Village	Popula- tion	Village	Popula- tion
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
India	1951	68.06	26.51	18.68	24.68	3.98	24.33
	1961	62.05	20.95	21.00	23.29	5.42	30.90
	1971	55.34	16.37	23.08	23.50	7.35	36.36
Madhya Pradesh	1951	81.80	50.16	13.83	28.51	0.78	7.01
	1961	75.26	41.78	18.17	31.59	1.16	8.46
	1971	66.35	32.32	23.30	32.83	1.95	12.12
Bastar District	1951	—N.A.—					
	1961	78.49	43.12	15.25	29.42	0.83	7.09
	1971	72.18	35.06	18.75	30.24	1.66	11.24

OCCUPATIONAL STRUCTURE

According to 1971 Census, 36.7 per cent of the population in Bastar district are workers while the figure was 60.57 in 1961. The fall in the rate for the country as a whole from 43.0 to 32.8 per cent can partly be explained in terms of the change in the definition of workers in the two censuses. The significantly higher fall in this rate in the case of Bastar calls for further scrutiny. This could be either due to drying up of employment opportunities or a higher proportion of part-time workers in the total work-force since a substantial portion of the part-time workers has been classified as non-workers as per the new definition in 1971. In both cases it reflects a deep-rooted malady of the economic system. The occupational distribution of total population as well as tribal population along with their percentage is given in Appendices 2.4 and 2.5.

An analysis of the male and female participation rate in rural and urban areas at two points of time, 1961 and 1971 gives interesting insights into the problem (Table 2.7). It may be seen that even the male participation rate in Bastar has fallen by a larger number of percentage points although the fall commensurates with that of the National Sample Survey region of Madhya Pradesh which Bastar* is a part. The fall in case of female

*Comparison of Bastar has often been made in this study with the NSS region, i.e., Eastern Madhya Pradesh, comprising Sarguja, Raigarh, Bilaspur, Raipur, Durg, Balaghat and Bastar districts of Madhya Pradesh.

TABLE 2.7 PARTICIPATION IN WORK FORCE IN INDIA, MADHYA PRADESH AND BASTAR

(Figures in percentage)

	<i>Male</i>		<i>Female</i>	
	1961	1971	1961	1971
	(1)	(2)	(3)	(4)
India	57.80	53.10	31.41	13.09
Madhya Pradesh	61.58	55.30	48.60	20.80
Bastar District	63.67	57.61	58.53	16.10

workers is, however, phenomenal. The fact that female participation rate has fallen drastically specially for the tribals both in urban as well as rural areas indicates that the employment opportunities for female are mostly temporary or part-time and are possibly drying up overtime. This problem is certainly present at the all-India level but its intensity and quantitative magnitude is more serious in case of Bastar. Since among tribals, females do take a substantial load of economic activities, the fall in their participation rate must be viewed with concern and be examined in depth.

It may be observed that 67.08 per cent of the working population in the district are cultivators and another 22.31 per cent are engaged as agricultural labourers. This suggests that owned cultivation and working in others' fields as hired labourer constitute the main source of livelihood for people in the district. The total percentage of workers depending on agriculture in 1971 works out very much close to the figure for 1961. However, what must be noted is that percentage of agricultural labourers has gone up from 13.5 per cent to 22.2 per cent in 1971 with a corresponding fall in the share of cultivators. The number of male agricultural labourers has almost doubled from 47,000 to 74,000 during sixtees. Secondly, there has been a dramatic fall in the number of female cultivators from 2,61,000 to a meagre sum of 62,000 only. While part of the fall in the number of female cultivators can be explained in terms of definitional factors, one can decipher a process of proletarianisation in the economy. In this process the cultivators are losing the right over the means of production and are forced to work as labourers in the fields of others. The growth of the reservoir of labourers faced with constant land productivity and falling labour productivity as discussed below must be symptomatic of ill-health of the agrarian economy of the region.

A very negligible fraction of the working population, *i.e.*, 2.42 per cent and 2.26 per cent are engaged in mining, quarrying, animal husbandry, forestry, etc., and household industry, respectively in 1971. This shows that diversification and expansion in the secondary sector have not been able to

withdraw any significant portion of labour force from agriculture. It may be mentioned that for this district the land-man (male agricultural workers) ratio was highest in 1961 as well as in 1971 when compared to the other districts in region or that of Madhya Pradesh.

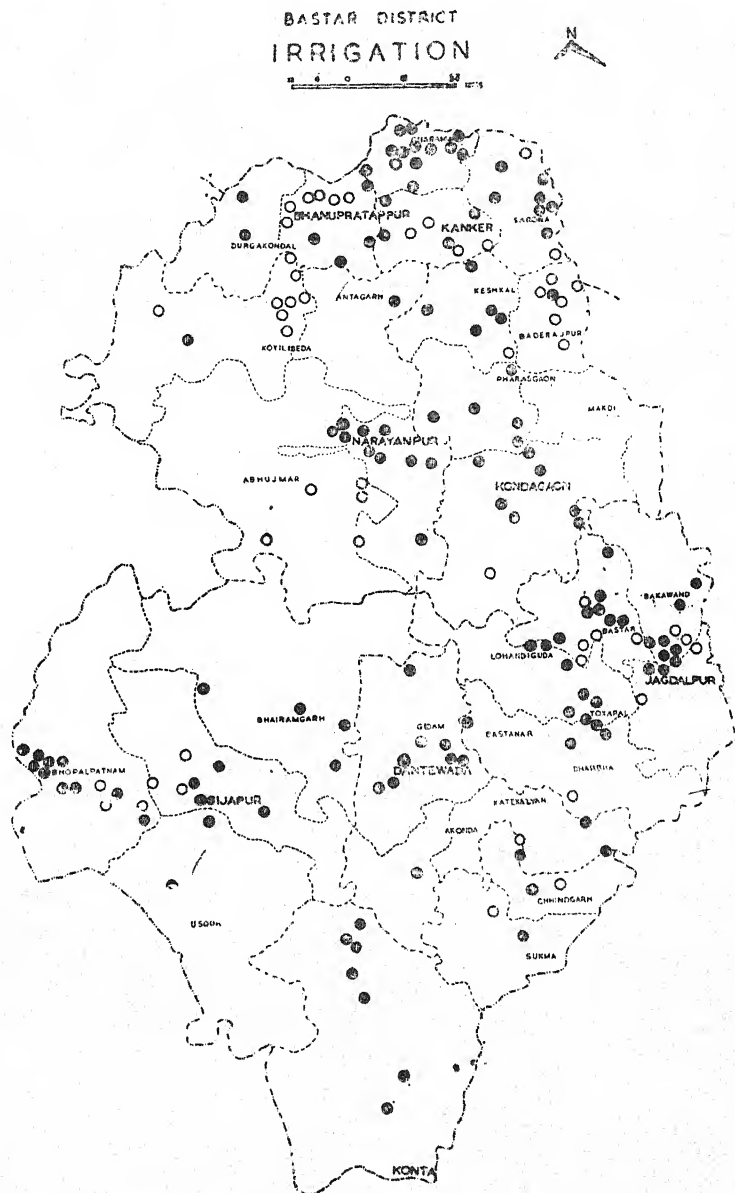
Tehsilwise occupational structure presents certain interesting variations although the fact that agriculture constitutes the main sector of the economy emerges quite clearly. Among persons engaged in various activities, cultivators outnumber agricultural labourers in all tehsils.

The inter-tehsil variation in the percentage of both cultivators as well as agricultural labourers (to total workers) is very high but since these two relate negatively with each other, the percentage of workers dependent on agriculture has very low variations. The four tehsils which have very high percentage of agricultural labourers are Kanker (35.9) and Jagdalpur (21.5) tehsils having a town each, and Narayanpur and Bhanupratappur having a large chunk of refugee population of the district. It may, therefore, be possible to infer that the agrarian relations in Bastar are changing in response to the factors exogenous to the district.




IRRIGATION

It is clear from Fig. 2.3 that irrigation potential is quite high in southern parts of Jagdalpur, northern parts of Konta, eastern parts of Bijapur and entire Dantewada, Kanker and Bhanupratappur tehsils. The major and medium irrigation potential cover 1,464 hectares in Kanker and Bhanupratappur, 314 hectares in Dantewada and 6,398 hectares in Konta. The tapped minor irrigation potential of groundwater is about 690 hectares in Kanker, 40 hectares in Kondagaon and 30 hectares in Dantewada. The minor irrigation potential of surface water tapped so far is 2,414 hectares in Kanker and Bhanupratappur, 744 in Narayanpur, 660 in Kondagaon, 367 in Jagdalpur, 783 in Dantewada, 695 in Bijapur and 335 in Konta. The total of surface water tapped so far through minor irrigation schemes in the entire district is about 6,000 hectares as shown in Appendix 2.6.

The utilisation percentage is very poor in all the tehsils in the district. It is below 10 per cent in Jagdalpur and Kanker whereas almost negligible in Narayanpur and Dantewada. It must be noted that the percentage of area irrigated in Bastar is much lower than the all-India as well as Madhya Pradesh figures. It must also be mentioned that while the national figure for percentage of area irrigated has increased from 18.36 in sixties to 22.92 in seventies and the district figure has increased from 1.80 to 1.93 per cent only, the figure for the eastern Madhya Pradesh region (NSS) has declined from 8.76 to 8.56 per cent. The gross irrigated land, however, starts declining for Bastar after 1973-74. The total area under irrigation which was stable at 13.3 thousand hectares during 1971-73 came down



References

-  Completed Projects
-  Under Construction
-  Proposed Irrigation Projects

to 9.1 thousand hectares in 1976-77. This indicates the sad state of affairs of the irrigation system in particular and agrarian economy in general in the district.

Table 2.8 shows an increase in the irrigated area under different sources. The increase in the irrigated area by canal is very poor which in fact becomes negative in 1976-77. Even in case of tanks, the area decreased marginally during the period 1971-73 to 1974-75. Also the number of wells abandoned is alarmingly high which has negative impact on the agricultural system. It may be noted that despite slight increases in the total number of sources of minor irrigation points, some sources like number of tubewells shows a declining trend (Table 2.9).

TABLE 2.8 GROWTH OF IRRIGATION BY SOURCES IN BASTAR

<i>(in '000 hectares)</i>								
<i>Item</i>	1969-70	70-71	71-72	72-73	73-74	74-75	75-76	76-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Area irrigated by canals	—	—	—	—	—	0.1	0.5	0.4
Tanks	7.5	7.2	7.2	6.2	6.0	3.6	3.5	4.4
Wells	1.1	1.1	1.1	1.3	1.3	1.4	1.2	1.1
Other sources	4.7	5.0	5.0	5.7	5.9	3.3	3.4	3.2
Gross irrigated area	13.3	13.3	13.3	13.3	13.2	8.4	8.6	9.1
Area irrigated more than once	—	—	—	—	—	—	—	—

TABLE 2.9 NUMBER OF IRRIGATION SOURCES IN BASTAR

<i>Source</i>	1968-69	1972-73	1974-75
(1)	(2)	(3)	(4)
Canals	—	1	2
Tanks	229	3,842	3,767
Reservoirs	—	—	—
Tube wells	103	333	579
Wells			
used for irrigation purpose	8,331	9,350	8,913
used for domestic purpose	5,513	6,357	6,792
abandoned	1,966	3,047	2,971

Of the total net irrigated area 43.13 per cent is under canal irrigation, 39.41 under wells, 9.96 under tank and the rest 9.50 under other sources of irrigation in Madhya Pradesh; whereas in Bastar area under canal irrigation is only 2.94 per cent while 42.98, 12.78 and 41.30 per cent are under tank, well and other sources of irrigation respectively. The percentage of

net irrigated area to the net area cultivated is highest in Jagdalpur followed by Bijapur and Kanker, although the figures are much lower than the State average of 9.13. There are tehsils like Dantewada and Konta where irrigation is non-existent (Table 2.10).

TABLE 2.10 DISTRIBUTION OF NET IRRIGATED AREA (AVERAGE OF 3 YEARS 1973-74 TO 1975-76) IN BASTAR AND MADHYA PRADESH

Item	Net irrigated area (in '000 hectares)	
	Bastar District	Madhya Pradesh
(1)	(2)	(3)
Canal	0.20 (0.04)	731 (100.00)
Tank	4.37 (3.23)	135 (100.00)
Well	1.30 (0.20)	668 (100.00)
Others	4.20 (2.61)	161 (100.00)
Total net irrigated area	10.07 (0.60)	1,695 (100.00)
Net sown area	749 (4.03)	18,695 (100.00)
Percentage of net irrigated area to net sown area	1.34	9.13

The above analysis clearly indicates that there is something seriously wrong with irrigation policy in the district and thus needs careful examination. The reason for the poor response in energisation of pump-sets in electrified villages is the fact that a small number of cultivators take rabi crops. Most of the cultivated area in the district is mono-cropped, paddy being the main crop. Rains start in the month of May and last till October, the rainfall being fairly regular during these months and also from year to year. The required water depth in the fields are more than adequately met by the annual rainfall.

In an area with regular and adequate rainfall, the cultivators naturally would not demand water for Kharif. As against this, most of the irrigation schemes in the project areas have been designed for Kharif. It is true that the tank irrigation schemes can yield water for rabi crops also, but cultivators do not come forward for taking this water. The reasons are not too far to seek. These are:

- (i) tribals in the district are entitled to the supply of water during the first few years at concessional rates. These rates are not charged

in case the agreement is made for the first two years and afterwards 50 per cent of the normal rates are charged. Since the tank schemes are designed for Kharif, agreement can only take place for Kharif crops while water for Rabi is given on the basis of demand. Thus the concessional rates are not applicable to rabi crops.

- (ii) All the cultivators in the district take Kharif crops and only a few take Rabi crops. The cultivators in general leave their cattle free during the Rabi season. Cattle cause extensive damage to Rabi fields and progressive cultivators going in for double cropping, have to suffer.
- (iii) Some of the important festivals of tribals fall during the Rabi season.
- (iv) Since Rabi crops have not yet been taken on a large scale, the farmers find it difficult to get the necessary inputs.

The non-tribal cultivators who are mostly the village leaders do not let the tribals enter into the agreement for Kharif water even during lean rainfall years. When the non-tribal cultivators are not willing to enter into an agreement, there would be problems since irrigation from tanks is done from field to field.

Groundwater Potential

Due to limestone deposits, parts of the district have good prospects of underground water. Geohydrological Survey of five blocks in Jagdalpur tehsil, viz., Jagdalpur, Bastar, Tokapal, Bakawand and Darbha has already been completed. However, for other tehsils the survey is either incomplete or covers only a part of its geographical area. In view of this, a method used by Sen and Misra* has been applied to estimate blockwise groundwater potential. Accordingly, the following formula was used to calculate the recharge of groundwater in each of the blocks in the district:

$$R = \frac{a \times r}{12} \times IR \times ET$$

where R = recharge of groundwater

a = sum of net area sown, cultivable waste and current follows in each block

r = normal rainfall

$\frac{a \times r}{12}$ = Conversion of normal rainfall (in inches) into the measure of acre-feet

IR = per cent of infiltration rate

ET = per cent loss of water due to evaporation and evapotranspiration.

*L.K. Sen and G.K. Misra, *Regional Planning for Rural Electrification: A Case Study in Suryapet Taluka, Nalgonda District, Andhra Pradesh*, National Institute of Community Development, Hyderabad, 1974, pp. 54-56.

The discharge from wells was based on the number of existing mechanical and mhone wells. This existing discharge was then subtracted from the recharge of groundwater. The balance is the surplus which can be lifted through newly constructed wells. The number of new mechanical wells was estimated by dividing the total annual surplus of groundwater by the annual discharge per mechanical well. According to these estimates, there is a potential of 27,359 mechanical wells and 54,718 hectares of irrigated area by these wells (Appendix 2.7).

AGRICULTURE AND ALLIED SECTORS

The agricultural population in the district derives almost 90 per cent income from crop farming, 5 per cent from livestock farming and 2 per cent from forestry and 3 per cent from the rest.* This highlights the importance of agriculture in the total economy.

Area under Cultivation

According to the Survey of India, the total geographical area of the district is 39,17,600 hectares, out of which almost 47 per cent is under forest, 6 per cent under pastures and grazing land, 2 per cent under tree crops and groves, 5 per cent under cultivable waste, and 2 per cent each under current and other fallows. Only 23 per cent of the area is sown; 4 per cent is sown more than once in the year 1971 as shown in Appendix 2.8. It must be noted here that estimates based on data of one year particularly in the agricultural sector may give misleading picture because of annual variations. It is, therefore, necessary to aggregate the data possibly for three years so that the effects of short-term fluctuations are ironed out to be able to decipher the major trends. To get the district level and state level picture for the sixties we aggregated the data for 1962-63, 1963-64 and 1964-65. For seventies the data for the years 1971-72, 1972-73 and 1973-74 have been aggregated. Some of these indicators have been directly taken from a study conducted by the Centre for the Study of Regional Development, Jawaharlal Nehru University.† Remaining indicators have been compiled for the present study.

It is estimated that the net cropped area for sixties was 638 thousand hectares which has risen to 704 thousand hectares in the district. This gives a rate of growth of 10 per cent over about ten years which compared to the negligible (almost zero per cent) growth rate at the national level is very high. The percentage of cultivated land has gone up from

*Based on the estimates made by the National Council of Applied Economic Research, A Perspective Plan (1979-1989) for Integrated Tribal Development in Bastar District (cyclostyled).

†See G.S. Bhalla and Y.K. Alagh, *Pattern of Agricultural Growth in India*, Sterling, New Delhi, 1979.

16.3 to 17.67. Within the district the variations in the land use pattern are noteworthy. In Konta tehsil about 66 per cent of the land was under forest while in Kanker it was only 13 per cent in the year 1971.

It has been mentioned above that the net sown area has increased significantly during sixties. This trend appears to continue upto 1976-77 as the area under cultivation goes up to 747 thousand hectares in 1976-77. However, the area sown more than once remains more or less constant during this period (Appendix 2.9). The distribution of cultivated area according to the size of holding is shown in Appendix 2.10. In the district about 50 per cent of the holdings is as large as 50 acres or more. The percentage of such holdings is even more in Dantewada and Konta tehsils but very low in Kondagaon tehsil, *i.e.*, 0.6 per cent.

The differentiation of relief, soil and climate within the district have caused spatial variation in crops which mainly include rice, karra or kutki, maize, kodon and jowar among cereals; horsegram, blackgram, greengram and bengalgram among pulses; mustard, seasamum and linseed among oilseeds; and sugarcane, spices, tobacco and vegetables among other crops. In terms of percentages almost 88 per cent of total cropped area at present is under cereals, 5 per cent under pulses, 6 per cent under oilseeds and 1 per cent under fruits, vegetables and other commercial crops.

The area under food crops has increased from 647.21 in 1965-66 to 732.44 hectares in 1976-77 (Appendix 2.11). In case of non-food crops the area increased upto 1975-76; after which it registered a drastic fall. It may be seen that the rate of growth of net sown area under all oilseeds including groundnut, etc., have declined significantly during the sixties. The only non-food crop to register some increase in area is sugarcane where the rate of growth is quite high (Table 2.11). Within food crops also the trends vary for different items and one can decipher a shift to the coarse grains like maize and jowar as their rate of growth has been higher than crops like paddy and wheat. In case of wheat the area has declined during sixties as may be seen in Appendix 2.11. As far as the non-cereals are concerned, the area has not shown an increasing trend except in case of vegetables for which it is expanding under the market pressures.

Productivity of Important Crops

The productivity per hectare of net sown area for the district as a whole has remained stagnant during the period 1962-65 to 1971-74*. The figure works out to be 888 rupees for the triennial 1971-74 using all-India prices. This average figure is reasonably high when compared to the national figure of Rs. 1,140 considering the level of backwardness of the district. However it must be noted that the rice producing areas generally show high productivity figures because the all-India price of rice is very

*The figures have been computed using data from the project of the Centre for the Study of Regional Development, now published, see Bhalla and Alagh, *op. cit.*

TABLE 2.11 AREA AND PRODUCTION OF IMPORTANT CROPS IN BASTAR

Sl. No.	Crop	(Area in hundred hectares)		Percentage increase (+) or decrease (-)	Output in hundred '000 tonnes		Percentage increase (+) or decrease (-)
		1964-65	1976-77		1964-65	1976-77	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Rice	4147.78	4596.36	(+) 10.81	301.96	353.00	(+) 16.90
2.	Wheat	27.38	33.24	(+) 21.40	1.68	1.20	(-) 28.57
3.	Jowar	41.96	74.38	(+) 31.02	3.19	3.10	(-) 2.82
4.	Maize	213.71	286.63	(+) 31.05	24.60	25.80	(+) 4.88
5.	Other cereals	1354.71	1738.85	(+) 28.36	23.80	17.70	(-) 25.63
6.	Total cereals millets	5790.54	6729.46	(+) 16.21	355.43	400.80	(+) 12.76
7.	Total pulses	630.87	504.30	(-) 20.06	21.52	13.70	(-) 36.33
8.	Sugarcane	6.42	10.12	(+) 57.63	0.21	0.32	(+) 52.38
9.	Total fruits	11.20	20.77	(+) 85.45	NA	NA	—
10.	Total condiments	45.81	46.33	(+) 1.14	NA	NA	—
11.	Total food crops	6484.02	7324.42	(+) 12.96	NA	NA	—
12.	Til	21.13	22.32	(+) 5.63	0.18	0.20	(+) 11.11
13.	Linseed	66.48	42.96	(-) 35.38	0.90	0.60	(-) 33.03
14.	Total oilseeds	420.67	373.62	(-) 11.18	NA	NA	—
15.	Fiber	6.13	7.54	(+) 23.00	NA	NA	—
16.	Total non-food crops	428.48	383.91	(-) 10.40	NA	NA	—
17.	Total cropped area	6912.50	7708.33	(+) 11.51	NA	NA	—

high. The productivity figure for the eastern region of Madhya Pradesh is, however, much higher than Bastar, the figure has risen from Rs. 1,018 in the sixties to Rs. 1,145 in the seventies.

The productivity per agricultural worker in the district has gone down significantly from Rs. 891 to Rs. 831 whereas the figure for eastern Madhya Pradesh has increased from Rs. 953 to Rs. 957. For the country as a whole the figures are Rs. 1,023 and Rs. 1,013 at the two points of time. In case the local prices of different crops in Bastar are taken which are more relevant for assessing the real income of people, the picture would be more dismal. One can only suggest that the agrarian economy of Bastar, stagnant in terms of land productivity, inputs used, etc., is weakening internally specially with regards to the conditions of the agricultural workers. A cropwise breakdown of the productivity gives further insight into the situation (Appendix 2.12.).

The productivity per hectare of major crops like paddy has remained stable during the sixties. However in the seventies it shows marginal increase upto 1976-77. In case of wheat, jowar, bajra, gram and arhar the yield per hectare has fluctuated from time to time. For example, the productivity of wheat increases significantly during sixties and thereafter starts falling. The productivity of seasamum, sugarcane, groundnut, castor and sunhemp has almost stabilized after 1970 with a marginal improvement during sixties (Appendix 2.13). The increase in land productivity in case of these non-food items is to be expected as considerable area shift took place away from these crops leaving the land better suited for these crops under cultivation.

Table 2.12 shows the percentage of food and non-food area to total cropped area. In 1964-65, the percentage of food cropped area was 94.84 which increased to 95.94 in 1976-77. The trend holds true for all the tehsils of the district as well.

An analysis of the cropping-pattern and the productivity trends show some structural changes in the district economy. Area under non-food crops specially that of groundnut, mustard, linseed, castor, etc., shrinking continuously overtime, shows a shift in the cropping-pattern to production of food crops. On the other hand, the rise in the food crops has not been in proportion to the area shifted to it allowing productivity figures to fall. These are the symptoms of the breakdowns of a tribal self-sufficient economy producing all the major items of consumption within the district. What seems to be emerging is a market oriented production structure. This is also reflected in the increase in the area and production of sugarcane which is partly marketed. The district also exports foodgrains to the outside world in exchange of which it gets mainly non-agricultural commodities with terms of trade not very favourable to the local people.

The intensity of cropping defined as the percentage of gross sown area

to net cropped area has declined from 105 to 183 for the district as a whole (Table 2.13). The intensity figures for India on the contrary have moved up from 115 to 118. The level of double cropping and its fall during sixties in Bastar must be viewed with serious concern since the cropping intensity in the eastern Madhya Pradesh (NSS region) is as high

TABLE 2.12 TEHSILWISE PERCENTAGE OF FOOD AND NON-FOOD CROPPED AREA TO TOTAL CROPPED AREA IN BASTAR

Sl. No.	Tehsil	Percentage of food cropped area to total cropped area		Percentage of non-food cropped area to total cropped area	
		1964-65	1976-77	1964-65	1976-77
(1)	(2)	(3)	(4)	(5)	(6)
1.	Jagdalpur	89.64	90.20	10.36	9.80
2.	Dantewada	95.46	97.69	4.54	2.31
3.	Konta	98.44	99.21	1.56	0.79
4.	Bijapur	98.85	99.41	1.15	0.59
5.	Kondagaon	92.47	92.58	7.53	7.42
6.	Narayanpur	94.47	95.29	5.53	4.71
7.	Kanker	92.88	95.86	7.12	4.14
8.	Bhanupratappur	96.47	97.29	3.53	2.71
	District	94.84	95.94	5.16	4.06

TABLE 2.13 TEHSILWISE PERCENTAGE OF GROSS SOWN AREA TO NET SOWN AREA IN BASTAR

Sl. No.	Tehsil	Percentage of Gross Sown Area to Net Sown Area (in Hectares)	
		1964-65	1976-77
(1)	(2)	(3)	(4)
1.	Jagdalpur	103.44	102.47
2.	Dantewada	104.21	101.58
3.	Konta	102.29	100.83
4.	Bijapur	101.51	100.39
5.	Kondagaon	106.47	105.29
6.	Narayanpur	104.46	102.87
7.	Kanker	115.59	109.71
8.	Bhanupratappur	104.66	102.91
	District	105.32	103.26

as 127.6 in 1971 which is comparable with some of the agriculturally most developed districts.

As regards inputs into agriculture, usage of bullocks is increasing. The same holds true in case of wooden ploughs. The use of electric pump sets and tractors is also increasing (Appendix 2.14). The use of high-yielding variety seeds and fertilizers however does not show any consistent pattern. Table 2.14 reveals that the coverage under HYV paddy increased upto 1972-73 then it became almost stagnant. Under hybrid maize there have been temporal fluctuations. Use of fertilizer per hectare of cropped area in the district also does not show an increase except in case of potassium (Table 2.15).

TABLE 2.14 HIGH-YIELDING VARIETIES COVERAGE IN BASTAR

('000 hectares)

<i>Crop</i>	<i>1969-70</i>	<i>70-71</i>	<i>71-72</i>	<i>72-73</i>	<i>73-74</i>	<i>74-75</i>	<i>75-76</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paddy	2.6	4.4	5.3	8.8	8.9	8.2	8.0
Wheat	0.2	0.4	0.6	0.9	1.0	1.0	1.0
Jowar	—	—	1.1	—	—	—	—
Maize	0.5	0.5	0.3	0.2	0.2	0.6	0.2

TABLE 2.15 USE OF FERTILIZER PER UNIT CROPPED AREA IN BASTAR
(IN TERMS OF NUTRIENTS)

(in kg/hectare)

<i>Name of fertilizer</i>	<i>1968-69</i>	<i>1972-73</i>	<i>1974-75</i>
(1)	(2)	(3)	(4)
N (Nitrogen)	0.19	0.79	0.14
P (Phosphorous)	0.08	0.23	0.12
K (Potassium)	0.02	0.03	0.03
Total	0.29	1.05	0.29

Seasonwise consumption of fertilizers in the district presents an interesting picture (Table 2.16). Both in case of HYV coverage and fertilizer used, we find that around 1972-73 there was a peak but on either side of this period the figures are significantly lower.

Looking at the average figures for sixties and seventies for the district as well as for the State, one gets an insight into the relative situation of inputs used. Number of tractors per 10,000 hectares for the district has increased from 1.88 to 2.70 while in eastern Madhya Pradesh it has doubled during the sixties, the figure being 16.7 in the seventies. Similarly in case

TABLE 2.16 SEASONWISE CONSUMPTION OF FERTILIZERS IN BASTAR
(IN NUTRIENTS FORM)

Season/fertilizer	1971-72	1972-73	1973-74	1974-75	1975-76
(1)	(2)	(3)	(4)	(5)	(6)
Kharif					
N	249	295	296	77	152
P	105	114	179	84	35
K	10	16	32	10	7
Rabi					
N	144	291	429	33	260
P	25	58	60	11	50
K	11	7	27	11	20

SOURCE: Directorate of Agriculture, Bhopal.

of the number of tubewells per 10,000 hectares the figure for Bastar, 6.66 compares very poorly with that of eastern Madhya Pradesh, the corresponding figure being 15.9. The input of fertilizer per 10,000 hectare measured in NPK terms has increased from 1.36 to 8.59 while for eastern Madhya Pradesh the figure has moved up from 14.6 to 85.3. It may thus be seen that while there has been some sporadic improvement in inputs used, the trend compares very poorly with that of eastern Madhya Pradesh which is one of the high productivity regions of the State. There is no doubt that the agricultural potential in the district is being grossly under-utilized.

ANIMAL HUSBANDRY

Livestock and poultry form an integral part of the lives of the tribals. The adivasis living in vast tribal areas have great affinity for all types of common livestock, *i.e.*, cattle, goats, sheep and poultry. However, they have not been able to develop their livestock on sound economic lines. Outbreak of certain contagious and soil-born infections results in high mortality which discourages investments in livestock. Due to illiteracy among the tribals the diseases control programmes are only marginally effective. In general, milk and milk products are not popular among the tribals, and cattle are used mainly as draught animal. Considering the pattern of use it seems the cultivators possess more bullocks than their requirements. There are very few bullock carts in the area and the bullocks are seldom used for transport purposes. Maximum benefit from every pair of bullocks is certainly not derived. Poultry is kept for eggs and preparing one or two dishes on ceremonial and festival occasions. Average income per family from poultry farming at present is negligible.

A look at the livestock and animal statistics in Appendix 2.15 reveals that the district had 11 thousand sheep, 62 thousand buffaloes, 365 thousand

goats, 11 thousand sheep, 62 thousand pigs and 910 thousand cocks and hens in the year 1976-77. The past trends indicate deterioration in the number of milch cattle except in the year 1971-72 when there was a little spurt in their population. In case of buffaloes their number declines after 1972-73 considerably, rises up thereafter marginally to go down again in 1976-77. A haphazard trend is also to be seen in the case of goats, sheep, pigs, cocks and hens.

FORESTRY

The district of Bastar with its 2,282 sq km of land under forests (as per the 1971 Census) is one of the richest forest regions in India. As per the pre-investment survey of forest resources 1970, it has a growing stock of 187 million cubic metres of industrial wood, and 4.37 million tons of bamboo. Besides, major forest produce of industrial importance, a variety of minor forest products are also obtained, *i.e.*, Gum, Honey, Kosa-cocoon, Tiknur, Baichandi, Churangi and Phool bahari. The district percentage of the forest area to the geographical area works out to 56.37 per cent as against the State percentage of 38.02 per cent and national percentage of 22.74.

The area under forest can broadly be divided into: (i) reserved forest, (ii) proposed reserved forest, (iii) orange area, and (iv) the waste land. Reserved forests are those that are 'scientifically managed' by the forest department (Fig. 2.4). These have been notified as reserved under the Indian Forest Act of the Darbar Notification. The forests adjoining the reserve forest lines and areas which are suitable for scientific management as reserved forests were declared 'orange areas'. It was earlier decided that all the orange areas would be transferred to the revenue department for allotment to landless or for declaration as village forests or village waste lands. There is rethinking on the earlier policy decision now. Village waste lands are those which are within the revenue villages and which have trees and shrubs standing on them. No definite policy has yet been laid down for the village waste land.

The tehsilwise break-up of various categories of areas mentioned above is as under (Appendix 2.16):

	(sq`km)
Reserved forest	9,613
Proposed reserved forest	6,793
Total orange area	4,809
Village banjar or waste land	5,707
Total	26,922

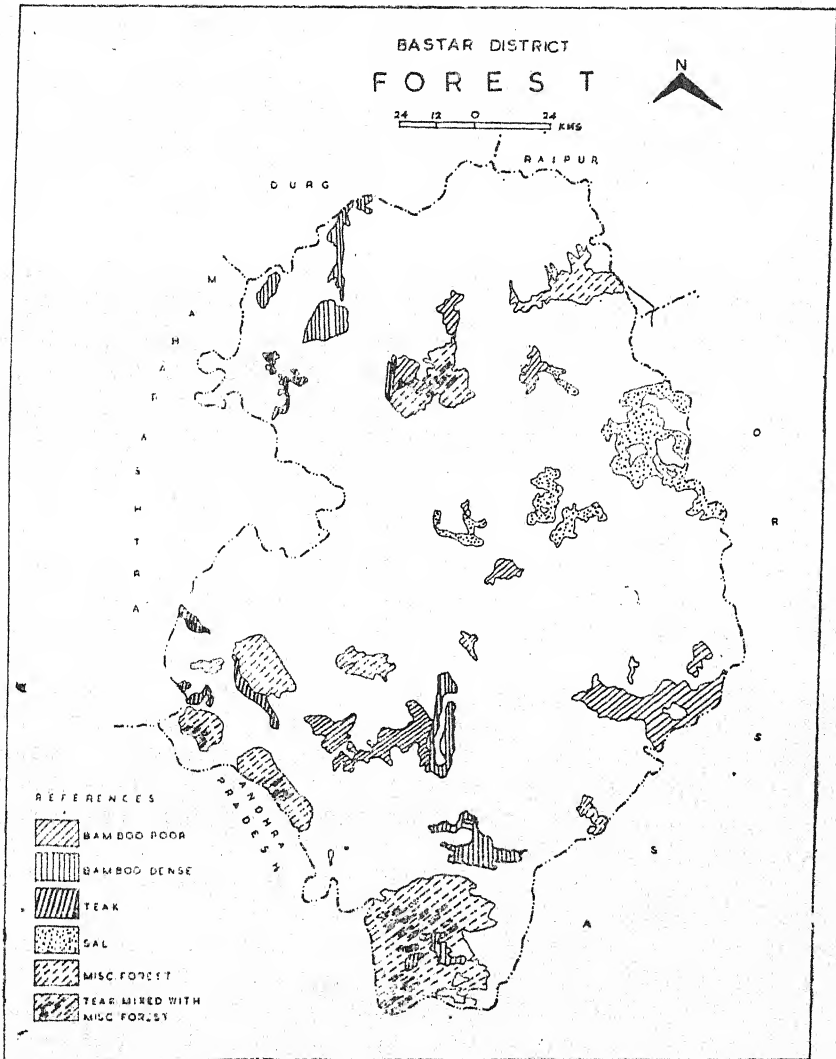


FIG. 2.4

The trend in the production of timber of minor forest produce is given in Appendix 2.17.

In the past the government has allowed nistar* at almost no cost to the villagers all over the State. There was also no restriction on the collection of minor forest produce. Today nistar is available in Madhya Pradesh within a set of instructions of the government which are applicable to all districts. The new rules are intended not to involve any hardship for graz-

*Nistar is a right which tribals have enjoyed from the time immemorial to use forest produce for their own consumption.

ing, supply of fuel wood and for agricultural implements. The main problem arises in respect of supply of timber for house-building. The villagers must now obtain their timber requirements from depots at half the market rates. These changes have not been accepted happily by the tribals. The scheme was, however, discontinued just before, 1977, election, probably due to political reasons.

INDUSTRIES

District Bastar is, more or less, dormant from the standpoint of industrial development in spite of a vast potential of mineral and forest resources. According to the 1971 Census, the percentage of workers in the household and non-household manufacturing activities in rural areas works out at 2.55 per cent as against the corresponding figure of 4.1 for eastern Madhya Pradesh. In 1961 the percentage of households and non-household industry was slightly higher than 1971 figure, i.e., 3.17 per cent although this is largely due to the change in the definition of workers in 1971 Census. The fall in the ratio of household to non-household industry workers during the sixties is also partly due to the definitional factor that has brought down in relative terms the number of household workers. However, the point to be noted is that the non-household worker component in the secondary workforce in rural areas of the district is low compared to the State figure. The percentage of workers in tertiary sector (trade, transport and other services) in rural areas is comparable to that of eastern Madhya Pradesh (the percentage of non-primary workers to total workforce for both comes out to six per cent) although the figure is quite low compared to the State figure.

The percentage of non-household manufacturing workers in the towns of Bastar is very low, i.e., 6.9 when compared to the regional and all-India figures of 10.9 and 14.8 per cent respectively. This ratio has fallen significantly from 11.3 in 1961 which does not appear to be solely due to definitional factors. The fall, therefore, reflects the weakness of the industrial base in the towns. The rate of fall in the number of household workers being significantly higher than the regional or State figure, also reflects drying up of employment opportunities as the small scale producers are being increasingly thrown out of the market because of the competition from outside the district. Although the percentage of urban to rural population in the district of Bastar is much lower than the State average in 1971, the two figures being 3.88 and 19.48 respectively, the concentration of non-household activities of the district in the urban areas appears to be highly significant. There are about 40 per cent of the total non-household manufacturing workers in the towns as compared to the corresponding figure of 22.3 per cent for eastern Madhya Pradesh. The relative position of the rural hinterland *vis-a-vis* the towns appears to have been affected

adversely as the share of towns in non-household manufacturing employment of the district was only 34.21 in 1961. In case of eastern Madhya Pradesh the relative share of towns in non-household employment in 1961 was higher than that of the 1971 figure; the 1961 figure being 25.4. Even at the all-India level it may be seen that the corresponding figures were 18.5 and 27.3 in 1971 and 1961 respectively. Thus it is evident that manufacturing sector is highly concentrated in the urban centres and it became more so during 1961-71.

It is unfortunate that the description of the modern industrial sector for the economy of Bastar begins and almost ends with the Bailadilla Iron-Ore Project. This, however, can easily be categorised as belonging to the primary extractive sector. Although it is a reasonably big project giving direct employment to approximately 2,000 people, it does not have any backward or forward multiplier effect within the economy as the total output is meant for export outside India. Besides this there is no major industrial establishment within the district. There are, however, a number of small scale industries spread over different tehsils. These may be grouped into two categories. In the first category we can have agro-based industries like saw mills, rice mills, flour mills, oil mills, wooden furniture, etc. In the second category there are service industries producing goods or services only for intermediate use. The activities included in this group would be ice factory, cold storage, welding, engineering, motor repairing, tyre and tube retreading, etc.

Most of the activities being connected with transport, storage, processing and other services depend primarily on the demand from outside the district. That is why there is an excessive concentration of these small scale industrial units in and around Jagdalpur town although some of the agro-based industries like rice, flour, saw mills, etc., are in the rural areas as well. Looking at the tehsilwise distribution of industrial units, one is distressed to note that in tehsils like Narayanpur, Kanta and Bijapur, there is no secondary activity excepting flour and oil milling. A brief discussion regarding their distribution, etc., is discussed below.

There are 49 registered units of rice and flour mills, the former being mostly of huller type. The total fixed investment of these units is Rs. 65,71,417 with a production capacity of 41,369 quintals per month. They provide employment to 275 persons on a regular basis. Then there are four oil mills with a crushing capacity of 1,438 metric tonnes oil seeds. The total capital investment in these units is of the order of Rs. 2.88 lakhs with an employment capacity for 26 persons. Also, there are 22 saw mills with a sawing capacity of 70,400 cu ft of wood per annum. The total fixed investment in these units is of the order of Rs. 9.55 lakhs and they provide employment to 292 persons regularly. Apart from these units are 15 furniture and wood working units, 7 printing presses, 18 tyre retreading units, 6 brick making units, 2 bidi making units, 11 bakeries, 1 R.C.C.

pipe unit and 30 general engineering and automobile workshops. All these units together provide employment to approximately 900 persons.

ECONOMIC INFRASTRUCTURE

Transport System

The communication system in the district is in an extremely under-developed state. There is no all-weather approach road towards Maharashtra or Andhra Pradesh. National Highway—43 goes through the district for Raipur towards Koraput in Orissa but the area in the south of the district being extremely backward, the road is of little economic significance in terms of providing marketing and other service facilities. The district, therefore, remains land locked as a semi-closed eco—system with its only all-weather opening towards Raipur on National Highway-43 (Fig.2.5).

For carrying iron-ore from Bailadilla to Vishakhapatnam a special railway line has been constructed which provides the rail connection to the district. This gives 150 km of track length for the district. Of late, the section between Kirandul and Jagdalpur is being used for carrying normal traffic although its capacity is very limited.

For purposes of trade and marketing the district has traditionally depended upon Raipur. Proposals for connecting the Dhamtari rail-head to Jagdalpur and Delhi-Rajura railway head to Jagdalpur have been under consideration for quite sometime now. The increase in the prices of forest goods and other produce of the district and the planned objective of developing the backward regions of the country should justify the construction of these railway lines at an early date.

The total road length in the district has increased during 1961-75 from 3,383 to 4,909 km (Table 2.17). The average road length for the district works out as 4.80 km per 100 sq km as against the State average of 11 km in 1971. Total road length per one lakh of population is 124.2 km. However, the figure of the length of roads is not truly indicative of the state of affairs mainly because of their concentration in and around a few nodes and their becoming non-functional during monsoon every year. The poor road system has its direct impact on the prices of the local goods and the essential commodities imported from outside the district. The poor condition of the fixed and the rolling stock makes the road transportation system financially non-viable and consequently the administration very weak. This results in the development strategies being less effective.

It, however, needs to be ascertained whether district has remained backward in spite of the existing transport and communication system or because of it. The question is relevant because utilization of both rail as well as road systems has been primarily to extract and withdraw the basic resources out of the district. It may be seen that the percentage of tribals

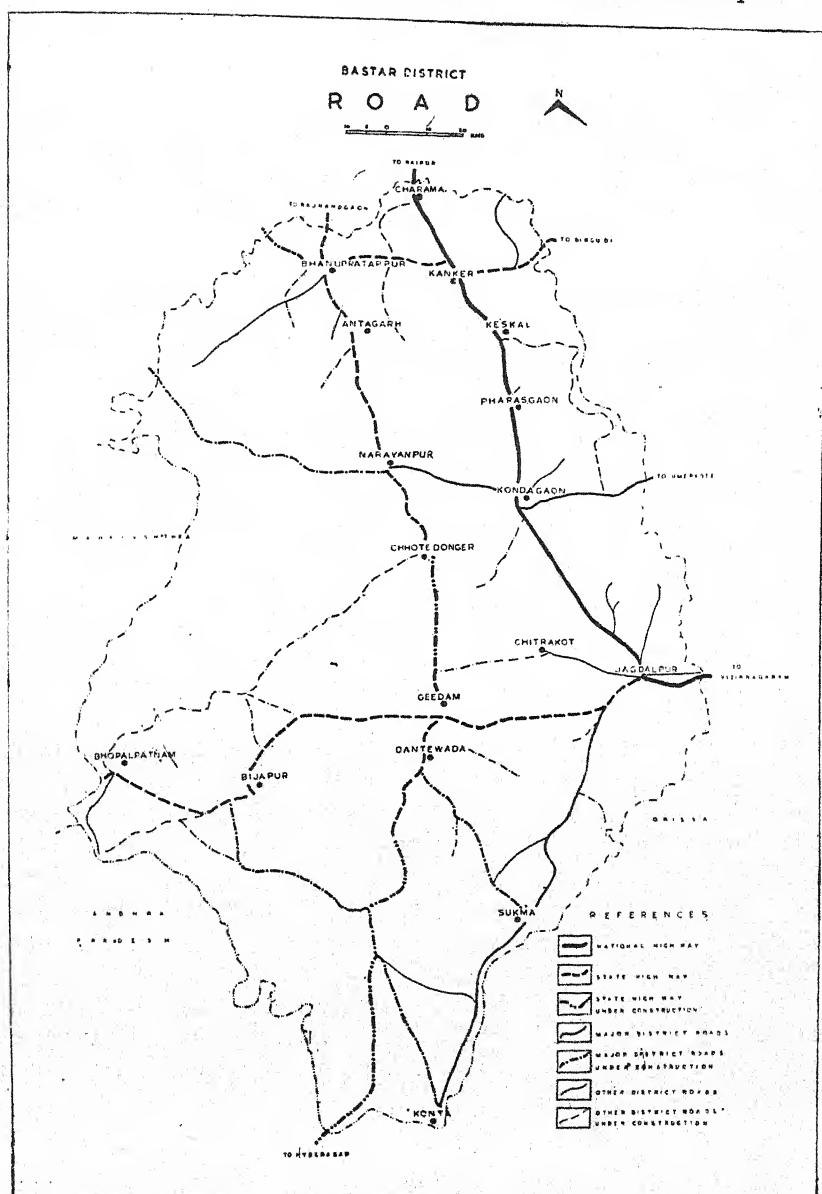


FIG. 2.5

travelling by transport system is very low because of their habits or incapability to make payment for using the service or sometimes due to the present institutional arrangement.* The tribals are averse to using

*In our field-trip we observed buses carrying an inscription that the passengers were not allowed to board the bus with raw fish, raw meat or any metallic weapon. This may be a major factor in discouraging the tribals from using the transport system. Besides, there is an unsympathetic attitude of the bus drivers towards the tribal population who generally board the bus for short distance travel.

TABLE 2.17 ROAD LENGTH IN BASTAR, 1961 AND 1976-77

Type of road	Road length (in kms)	
	As on 1961	As on 1976-77
(1)	(2)	(3)
<i>Metalled road</i>		
PWD road	601.00	1,207.00
Local bodies	—	6.00
Forest road	—	—
Total	601.00	1,213.00
<i>Non-metalled road</i>		
PWD road	795.00	996.01
Local bodies	15.00	26.40
Forest road	1,972.00	2,693.90
Total	2,782.00	3,716.31
Total road length in the district	3,383.00	4,909.31

not only the transportation but also other public utilities provided in the district.

One must examine what has been the impact of the transportation activities on the developmental potential of the regional economy. The tehsilwise distribution of the existing transport and communication facilities reflects extreme disparity. In case of Jagdalpur block the density of roads, road mileage per lakh population and percentage of villages connected by all fair weather roads are very high while for the other blocks the corresponding figures are miserably low. Besides, most of the villages above 2,000 population are connected by road which indicates that such villages come up only on the road side. The transportation system, therefore, appears to be reminiscent of the colonial period when the major role of the transport system was to expropriate the local resources for use by the industries outside the region.

Marketing

In the subsistence economy one is likely to assume that there would be little marketable surplus. The situation is somewhat different in case of Bastar which is getting more and more integrated with the economy of the State overtime through the transport system. Marketable surplus is being exported out of the district not only in terms of minerals and forest produce but also in terms of agricultural output. The local people who enter the market only to exchange goods on barter basis give a substantial portion of their production to procure the basic requirements of existence.

However, the organised markets are few and far between. For the entire district there are only seven regulated markets located at Jagdalpur, Keshkal, Charama, Kondagaon, Narayanpur, Bijapur and Konta. It may be seen that most of the markets are located in the north-eastern and eastern parts of the district. The western and southern parts are completely devoid of such markets. In terms of coverage, a regulated market serves on an average, about 3,300 sq km, about 400-500 villages, and about 1.5 to 2 lakh population*, the figures corresponding to the situation in 1971.

The weekly markets or 'hats' play an important role to serve the tribal economy. Generally in these markets tribals exchange their agricultural produce and minor forest produce like gum, grass, 'mahua', tamarind, etc., to get commodities like cloth, match, salt, spices, etc. These are the places where tribals visit to meet their friends and relatives even when they have nothing to exchange. Sometimes they walk as far as 25 km to get to the market place.

There were 155 'hats' in 1976 functioning over the entire district. According to 1961 Census, their total number was 118. The growth of the hats during sixties can be taken as an indication that the process of surplus extraction has become more effective.

It must be mentioned that the tribal population does not get fair deal at the hands of the traders mostly coming from outside the district. In many cases there is an integration of functions as far as the traders are concerned as they often act as money-lenders and sometimes as owners of lands. The combination of these functions make them immensely powerful. This they use mostly to exploit the local population taking advantage of the non-competitive situation in the market. The money lender-cum-trader-cum-employer not only charges very high rates of interest but also compels them to sell their produce as well as family labour at much below the market price. In fact to the illiterate tribals, prices are nebulous concepts and the barter system offers ample opportunity for exploitation. It ought to be mentioned that the government has tried to come in a big way to the rescue of the local population by providing cooperative marketing facilities. Vested interests, however, rendered this system ineffective, inefficient and finally inoperative.

Posts and Telegraphs

The district has only one head post office at Jagdalpur town. However, there are 25 sub-post offices, 23 public call offices, 162 branch post offices and 9 telegraph offices (Table 2.18). The official statistics showing the increase in the number of branch post offices, telegraph offices and public call offices (Table 2.19) are rather impressive.

*R.P. Misra, *et. al.*, *Regional Planning and Development Planning in India: A New Strategy*, Delhi, 1974, pp. 55-56.

TABLE 2.18 TEHSILWISE DISTRIBUTION OF POST AND TELEGRAPH FACILITIES IN BASTAR, 1976-77

<i>Name of tehsil</i>	<i>Head Post Office</i>	<i>Sub- Post Office</i>	<i>Public Call Office</i>	<i>Branch Post Office</i>	<i>Telegraph Office</i>
(1)	(2)	(3)	(4)	(5)	(6)
Jagdalpur	1	6	6	35	2
Dantewada	—	5	4	24	—
Konta	—	—	2	8	—
Bijapur	—	2	2	18	—
Kondagaon	—	5	4	21	3
Narayanpur	—	4	2	23	1
Kanker	—	2	2	23	2
Bhanupratappur	—	1	1	10	1
Total	1	25	23	162	9

SOURCE : Draft Sub-Plan, ITADP, Bastar District, 1976

TABLE 2.19 GROWTH OF POST AND TELEGRAPH FACILITIES IN BASTAR

<i>Year</i>	<i>Branch Post Office</i>	<i>Telegraph Office</i>	<i>Public Call Office</i>
(1)	(2)	(3)	(4)
1968-69	132	5	11
1969-70	112	5	13
1970-71	118	5	13
1971-72	118	5	15
1972-73	91	5	15
1973-74	173	5	16
1974-75	154	5	16
1975-76	155	—	17
1976-77*	162	9	23

SOURCE : Post and Telegraph Office, Jagdalpur.

*Draft Sub-Plan, ITADP, Bastar District, 1976.

Official records show that all the tehsil headquarters in the district are connected by telephone. However, these do not work for a major part of the year on account of poor maintenance and the use of wooden poles in some of the 'less important' areas. The postal system is also very poor. Letters from Bhopal often take six days to reach the district headquarter and seven or eight days to tehsil headquarters, not to talk of the villages.

Medical Facilities

The medical facilities available within the district of Bastar as measured

through the average figure do not compare very badly with the State level figures. This is evidently due to uniform medical policy and the population criteria in providing hospitals, dispensaries, etc., followed at the State level. The number of hospitals in the district is six and there are 33 primary health centres and 13 government dispensaries. In addition there are some ayurvedic dispensaries. The growth pattern of medical facilities during 1969-70 to 1976-77 is presented in Table 2.20. The spatial distribution of medical facilities within the district tallies more or less with the distribution of population which implies that there will not be significant intra-district variations in per capita availability of medical facilities (Appendix 2.18). The real problem, however, is that of mal-functioning and ineffectiveness of the medical institutions. The working conditions and facilities to the patients deteriorate as we move from urban centres to the interiors. The general complaint has been that in some parts of the district the posts of the doctors and the other staff remain vacant as people are not willing to go to the interior for obvious reasons. The logic works in a vicious circle.

TABLE 2.20 GROWTH OF MEDICAL FACILITIES IN BASTAR 1969-70 to 1976-77

<i>Year</i>	<i>Hospital</i>	<i>Primary Health Centre</i>	<i>Dispensary (Government)</i>
(1)	(2)	(3)	(4)
1969-70	4	25	7
1970-71	4	32	7
1971-72	4	32	7
1972-73	4	32	11
1973-74	7	32	11
1974-75	6	32	11
1975-76	6	32	11
1976-77	6	33	13

SOURCE: Office of Zila Family Planning & Health, Jagdalpur.

In Jagdalpur, for instance, the percentage of bed occupancy was actually 111.75 in 1975. The patients had to be provided with extra beds. But in the interior areas the number of patients turning upto the dispensaries is very low. The attendance of outdoor patients in Bastar, Darbha, Lohandiguda and Nangur areas is comparatively high, *i.e.*, from 30 to 54 patients per day; but in the rest of area, the average number of daily out door patients varies between 14 to 19 only.

Jagdalpur being the district headquarter, has better medical coverage. It has two hospitals, seven primary health centres and four civil dispensaries. The services of medical specialist, ophthalmologist, gynaecologist, child specialist and even radiologist are available only in the headquarter hospital. Facilities for surgical operations, X-ray and pathological test are also

available here. A visit to the hospitals, however, is good enough to indicate who are the beneficiaries of these facilities.

The local people still use indigenous medicine, herbs, fruits, etc., prescribed by the witch doctors and quacks because of their long tradition and the ineffectiveness of the modern medical system. Basically, they lack proper orientation towards the use of modern medicines. Also there is a lack of staff, medicines and other facilities in the interior areas.

EDUCATION

Prior to independence no effective step was taken to spread education among the tribal folk in the district. Consequently the tribals are illiterate, the percentage of literacy being only 9.64 in Bastar as against the State and all-India figures of 22.12 and 29.34 respectively. Analysing the trend one should infer that the literate population has grown at a slow rate in the district during sixties. Not only the base year literate population is low, the rate of growth too is significantly lower than the national figure. Besides, improvement in the percentage of literacy can be partly attributed to a large inflow of non-tribal population among which the literacy rate is significantly higher.

An analysis of Table 2.21 clearly reveals that there has been a lot of quantitative expansion of educational facilities. However, the standard of education and its acceptance among the tribals is very poor. Whereas there is a Primary School in almost every village, the student-teacher ratio based on attendance at the primary level is as low as 1.17. These ratios again on the basis of attendance work out as 1.8 and 1.6 for middle and higher secondary level respectively. It is also clear that at middle and higher

TABLE 2.21 GROWTH OF EDUCATIONAL INSTITUTIONS IN BASTAR
1969-70 TO 1976-77

<i>Year</i>	<i>Primary School</i>	<i>Middle School</i>	<i>Higher Secondary School</i>	<i>College</i>	<i>Technical and others</i>
(1)	(2)	(3)	(4)	(5)	(6)
1969-70	1,466	152	25	3	1
1970-71	1,496	152	27	3	1
1971-72	1,597	185	31	4	1
1972-73	1,961	231	38	4	2
1973-74	2,272	285	45	4	2
1974-75	2,389	291	45	4	2
1975-76	2,346	299	48	4	2
1976-77	2,087	299	48	4	2

SOURCE: District Statistical Handbook, Bastar, 1977.

secondary level, several among the local people join these institutions mostly for the free meal, etc. Drop out rate after primary level education is very high, i.e., 96 per cent among boys and 99 per cent among girls. Reason for the lack of interest in middle level and higher secondary level of education amongst the tribals is very clear. The tribal families consider their children as economic asset and use them for work in fields and forests. The rate of passing examination is much lower in the district as compared to the State. At primary school level the rate is 70 per cent whereas at the middle level it is 20 per cent.

CHANDRAPUR

Situated at the corner of Maharashtra, Madhya Pradesh and Andhra Pradesh, Chandrapur, earlier known as Chanda is the largest district (26,128 sq km) of Maharashtra. It is bounded in the north and the west by the districts of Bhandara, Nagpur, Wardha and Yeotmal of Maharashtra, in the south by Adilabad and Karimnagar districts of Andhra Pradesh and towards east by Bastar and Durg districts of Madhya Pradesh. Like its neighbouring district Bastar, Chandrapur too has a low population density and is relatively backward. However, in this respect, it should be remembered that Chandrapur is not quite as remote as Bastar in terms of accessibility or connectivity through the transportation network.

The Wainganga river divides this district into two sections with Brahmapuri, Gadchiroli and Sironcha tehsils in the eastern half and the remaining tehsils of Chandrapur, Warora and Rajura in the western half. There are eighteen blocks or Panchayat Samities in the six tehsils of Chandrapur. Mul, Gondpipri and Chandrapur blocks make Chandrapur tehsil; Warora, Bhadrawati and Chimur blocks make Warora tehsil; and Brahmapuri, Sindewahi and Nagbhid blocks constitute Brahmapuri tehsil. Gadchiroli tehsil is made up of Gadchiroli, Armori, Chamorshi, Dhanora and Kurkheda blocks while Sironcha, Aheri and Yetapalli blocks form Sironcha tehsil and Rajura block on its own forms the tehsil with the same name (Fig. 2.6). There are seven towns in the district with an urban population of 16,40,137. The number of inhabited villages is 2,840 with 533 uninhabited villages while the rural population is 230,059 (1971 Census). With the sole exception of Desaiganj, the six towns (Chandrapur, Ballarpur, Ghugus, Warora, Rajura and Sasti) lie on the western side of the Wainganga river.

PHYSIOGRAPHY

The district can be divided topographically into six zones:

The Eastern upland comprises two-thirds of the Gadchiroli tehsil and almost the entire Sironcha tehsil barring the lowland strips along the

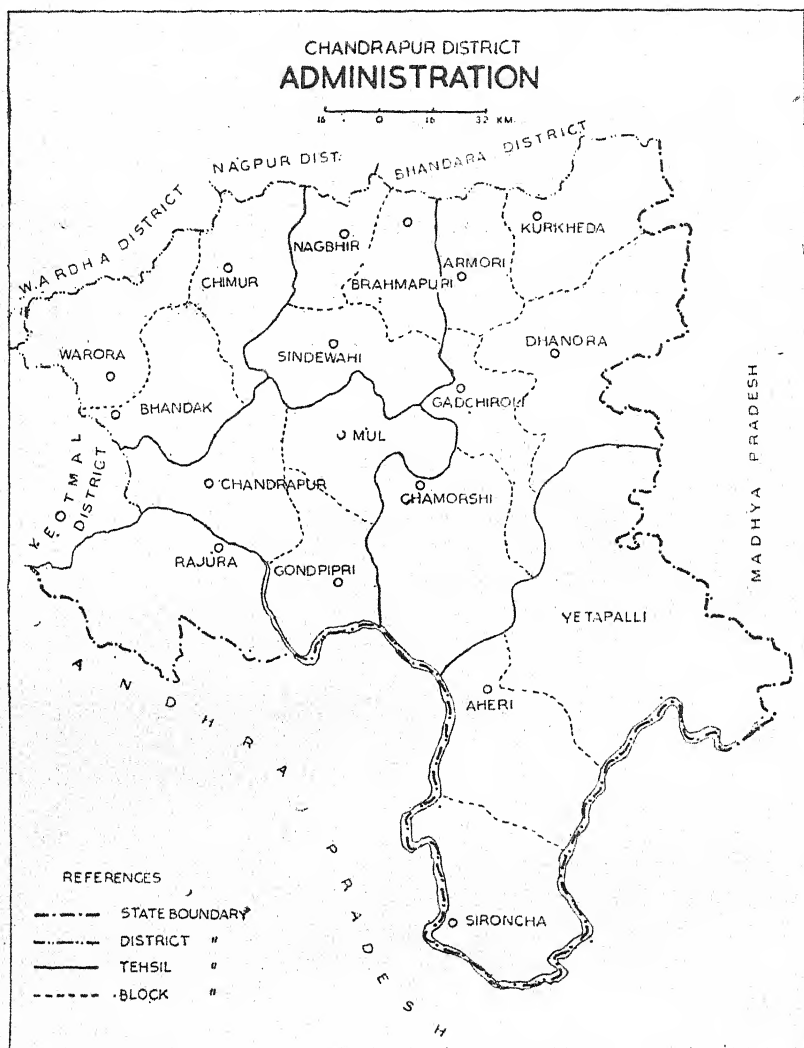


FIG. 2.6

Godavari and Pranhita rivers. It is hilly and covered with thick forests accounting for nearly a-third of the total area of the district. The land, in general, slopes westwards and southwards. Granular weathering has resulted in gravelly and coarse sandy soils all over the region. Net sown area within the region does not even exceed a-tenth of the total geographical area, rice being its main crop. It is a relatively backward region.

The Western upland lies between Wardha and Wainganga river basins comprising parts of Warora, Chandrapur and Brahmपुरi tehsils. It has sandy soil. Rice, jowar and sugarcane are the main crops. This zone covers one-sixth of the district area. These areas are generally well-

wooded being covered by dense forests of the north Chandrapur division.

The Wardha lowland is a featureless plain, sloping gently south-eastwards, the elevations being less than 250 metres. Constituting the core of the most populous tract of the district, it covers a-sixth of the total area. The lowlands which are agriculturally very productive and hence sustaining high population densities in the rural areas, include the valleys of Warora and Chandrapur tehsils and the northern parts of Rajura tehsil. The soils of the lowlands are rich and varied. Deep, rich, re-deposited black regur loams and clay loams occur all along the Wardha and Penganga valley floors. Known locally as the '*Kali*' soils these agriculturally very productive soils are ideally suited for rabi crops due to their high moisture retentive capacity. These soils tend to become water-logged and poorly aerated during the monsoon rains and hence are not well-suited for the Kharif crops during the monsoon months. The Wardha lowland has perhaps the least area under forest.

The Wainganga lowland is an elongated strip which epitomises the agrarian economy of the district. This is an undulating rolling plain, sloping gently and narrowing southwards. The general elevation is about 250 km and the only higher elevations occur on the banks of the river. Soils are light coloured and sandy that cannot be ploughed before the rains. These cover extensively the lower grounds along the banks of the Wainganga and are generally found productive. The cropping-pattern of this region reveals mono-culture, rice dominating the scene accounting for more than two-thirds of the gross cropped area. The poorer, stony and gravelly soils of the higher ground are covered by fairly dense mixed deciduous forests, similar in many respects to those found in the west.

The Sironcha lowland lies mainly adjoining the Godavari; it is much narrower along the Pranhita than along the Godavari. Inaccessibility and isolation are the striking features of life and economy of the people of the area. Kharif rice is the main crop of these lowlands having fairly drained *kanhar* soils and immature *kachar* soils.

The Rajura upland is in the southern and western parts of the Rajura tehsil. A very large number of springs is to be found all over the plateau surface at different heights along the valley flanks of streams where the perched water table in the porous intratrappeans are exposed. These springs constitute the main source of water supply for the hamlets scattered over the plateau. Almost the entire plateau surface is covered by the extensive Manikgarh State Forest. Soils are poor, stony, reddish and lateritic. Cropping, if any, is of a seasonal and shifting nature confined mainly to the rainy monsoon season. Bajra, gram and other pulses are the main crops.

CLIMATE

The climate of the district is characteristic of Central India with extreme summer and winter seasons. The average temperature in the summer months is about 40°C. The humidity varies with the season. The south-west monsoon is the main source of rain in the district. The average rainfall is 1,261 mm per annum. The rainfall, in general, is well spread over the season and is dependable. The eastern zone has an assured rainfall of approximately 1,520 mm per annum, the Central Zone having 1,300 mm per annum and the western zone having 1,140 mm per annum.

SOIL CONDITION

The soil of the district falls into clearly defined tracts and each of these tracts display cropping patterns of a wholly different kind. The most fertile tracts are found in the Wardha and Wainganga valleys. The varieties of the soil in the district are numerous and are known by many local names but they could be grouped under the following representative classes, viz., Kali, Kanhar, Barsi, Morand, Khardi, Wardi, Retari or Bardi, Pendhari and Kachhar. On the extreme west, on the left bank of the Wardha and subsequently the Godavari, there is a broad strip of black soil known as Kali, which has a retentive capacity of moisture and hence can be used to grow a dry rabi crop (Fig. 2.7). Further in the interior, but immediately adjoining this open tract there is a range of small hills with poorer soil at their feet and in the intervening strips. This soil is of little use without irrigation but could be ideal for rice and sugarcane. Further eastward and on either bank of the Wainganga, black loam reappears and is accompanied by a few rice growing villages. East of the Wainganga valley the soil becomes poor. Rice is the staple crop of this tract.

DRAINAGE

The district is blessed with one of the best river systems in the State. The entire district falls within the Godavari river drainage. About 82 per cent of the total river length is perennial and provides good scope for irrigation and industrial development. The major rivers in the district are five, namely, the Penganga, the Wardha, the Wainganga, the Godavari and the Indravati. The Penganga flows into the Wardha near Ghugus and the combined water (known as Wardha river) is emptied into the Wainganga near Ashti. The river after this confluence is known as the Pranhita. Then, forming the western boundary of the district, the Pranhita meets the Godavari further south near Sironcha, which subsequently meets the Indravati which forms the eastern boundary of the district. In addition to

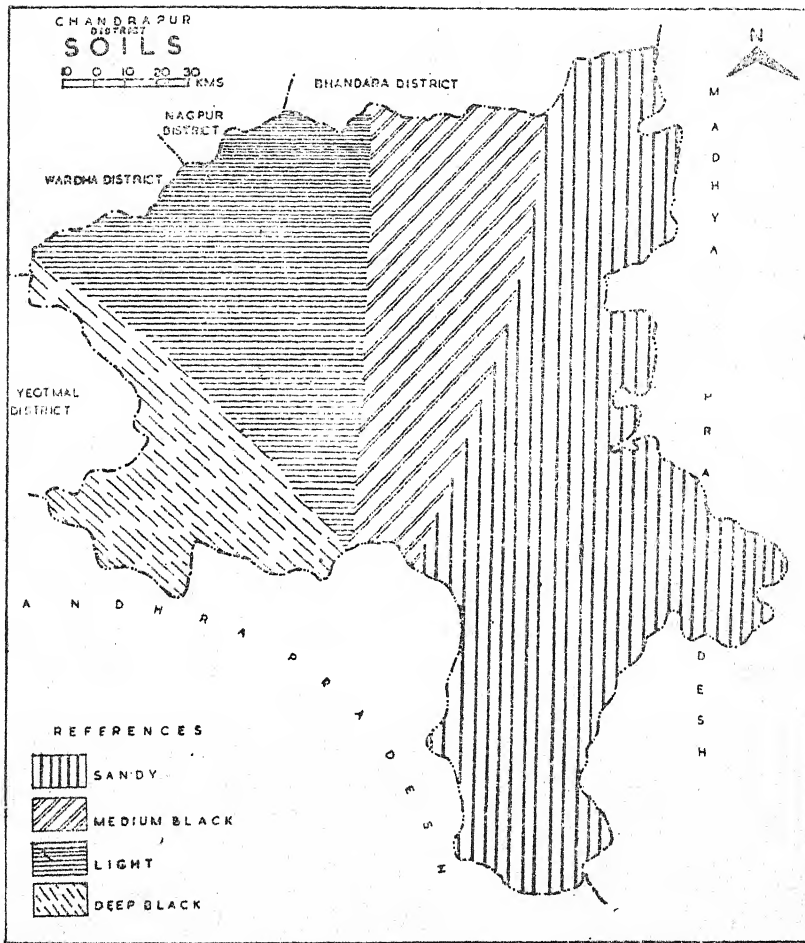


FIG. 2.7

these major rivers, there are numerous tributaries crossing the district. Most of these originate in the uplands and drain a large area.

PEOPLE

This largest areal district of Maharashtra houses only 3.25 per cent population of the State giving a low population density of 64 persons per sq km (Table 2.22). About 10 per cent of the nearly 16.40 lakh population is urban and 14.10 per cent population is scheduled tribes. As regards urbanization, although the level is higher than its neighbour Bastar, it is considerably lower than any district in Maharashtra. The sex ratio (971:1000) is lower than the State figure which is surprising considering that Bastar has a sex ratio higher than that of Madhya Pradesh.

This ratio for the urban areas in Chandrapur is, however, higher than the corresponding figure for the State, the two figures being 878 and 320 respectively. The sex ratio falling during sixties both in rural as well as urban areas is suggestive of male selective immigration into the district.

The main tribes inhabiting the district are: Gond, Halba, Pardhan, Kavar, Kolam, Bhil, Thoti and Koya. It is clear from Table 2.23 that out of six tehsils in Chandrapur district, tribal population is concentrated

TABLE 2.22 AREA, POPULATION AND VILLAGES IN CHANDRAPUR

<i>D istrict/ tehsil</i>	<i>Area km²</i>	<i>Popula- tion per km²</i>	<i>No. of villages</i>		<i>No. of towns</i>	<i>Population</i>
			<i>Inhabited</i>	<i>Unhabi- ted</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur District	25,641.0	64	2,840	533 (15.80)	7	16,40,000
Chandrapur	3,040.7	132	388	82 (17.45)	3	4,01,000
Warora	3,320.4	93	445	159 (26.32)	1	3,10,000
Brahmapuri	2,323.2	121	342	82 (19.34)	—	2,81,000
Gadchiroli	7,433.3	51	860	89 (9.38)	1	3,82,000
Sironcha	8,005.5	18	556	94 (14.46)	—	1,40,000
Rajura	2,010.6	70	249	27 (9.78)	2	1,26,000

SOURCE: Socio-Economic Review and District Statistical Abstract of Chandrapur District, 1975-76.

NOTE: Figures in brackets are percentages.

TABLE 2.23 TEHSILWISE PERCENTAGE OF TRIBAL POPULATION IN CHANDRAPUR, 1971

<i>Name of tehsil</i>	<i>Percentage of tribal population</i>
(1)	(2)
Chandrapur	Nil
Warora	Nil
Brahmapuri	Nil
Gadchiroli	32.28
Sironcha	53.07
Rajura	26.83

only in three tehsils, namely, Gadchiroli, Sironcha and Rajura. The percentage of tribal population to total population is highest in Sironcha. The blockwise percentage of tribal population is presented in Appendix 2.19. Again, it is in Sironcha tehsil that wide variation in this regard is observed. Yetapalli block has the highest percentage of tribal population, i.e., 83.70, the lowest figure occurring in Sironcha block, i.e., 17.75. Similar variations are observed in Gadchiroli tehsil. In Dhanora block the percentage is as high as 71.43 while in Chamorshi it is as low as 18.53. Out of the total of 2,840 inhabited villages in the district, 37.17 per cent have less than 200 inhabitants, 29.2 per cent are within population size between 200-499. At the other extreme only three villages have more than 10,000 population. It is interesting to note that the three tribal tehsils, viz., Gadchiroli, Sironcha and Rajura have the largest number of villages with population less than 200 (Appendix 2.20).

The percentage of urban households in the district has increased from 8.11 to 10.59 during the decade 1961-71 (Appendix 2.21). The percentage of occupied residential houses to total households has, however, reduced from 94.33 in 1961 to 89.66 in 1971, which would imply that housing availability is declining as in the case of Bastar district. Also, the deterioration in the housing conditions has been far more in the urban areas.

OCCUPATIONAL STRUCTURE

According to 1971 Census, 40.42 per cent of the population in Chandrapur district are workers. Among the workers 45 per cent are cultivators and 35.17 per cent are engaged as agricultural labourers. A small percentage is found engaged in livestock, mining and quarrying (3.83%), manufacturing industries (5.63%), construction (0.96%), trade and commerce (2.50%) and transport (0.95%) and other services (5.96%). Tehsilwise occupational structure, by and large, follows the same pattern as that of the district. A comparison of the occupational structure in 1961 and 1971 reveals certain interesting features. The percentage of working population has declined sharply from 1961 to 1971. The percentage of cultivators to the working population has gone down substantially while the share of construction, trade, commerce and transport has generally improved in all the tehsils of the district (Appendix 2.22). This can be partly in terms of the change in the definition of workers and its greater effect on the category of cultivators.

IRRIGATION

In Chandrapur, the net irrigated area is quite high (approximately 17 per cent of net area sown), but this figure can often be misleading. To determine the efficacy of the irrigation system, it is important to look at its nature (Fig. 2.8). As is shown in Table 2.24, tanks are

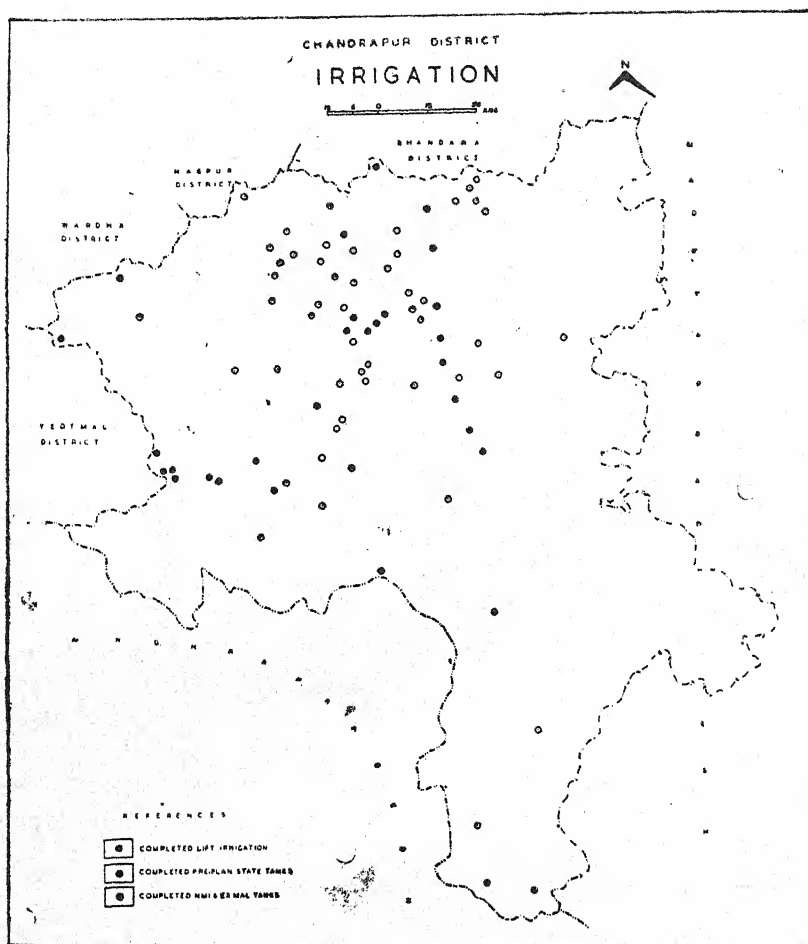


FIG. 2.8

the dominant form of irrigation, accounting for 74 per cent of the total irrigated area. The nature of tank irrigation is such that it can merely redistribute the rainfall that occurs in a short period of time over a larger portion of the cultivating season. This kind of irrigation is very different in nature from the canal irrigation which has perennial source. The irrigation of the latter kind helps to remove the annual fluctuations that occur in monsoon dependent agricultural output by stabilizing the water input. Tank irrigation on the other hand is only a mean of optimizing the use of water as is available in a year and cannot be of much help to reduce the fluctuation in output that occur due to fluctuation of rainfall from year to year. Thus, the inherent uncertainty that exists in monsoon dependent agriculture and acts as a dampener on the modernization and dynamiza-

TABLE 2.24 GROWTH OF IRRIGATION IN CHANDRAPUR BY DIFFERENT SOURCES

Item	(in 000 hectare)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Area irrigated by</i>								
Canal		18.76	18.51	18.88	18.88	20.93	23.72	22.10
Tank		85.76	87.39	81.61	85.61	83.44	86.62	78.63
Wells		1.98	1.86	1.76	2.06	1.50	1.67	2.28
Others		3.36	3.02	6.05	4.10	4.24	3.56	3.02
Net irrigated area		109.76	110.79	108.29	110.65	110.15	115.57	106.02
Gross irrigated area		110.57	111.68	109.53	111.59	110.85	117.35	110.09

tion in traditional agriculture, is prevalent in this district despite the seemingly respectable irrigation level.

The second major source of irrigation is canal water under which the net irrigated area is about 20 per cent. The area irrigated by this source is 22,100 hectares. The area irrigated by wells is negligible (about 2 %). There are 7,350 irrigation wells in use in the district irrigating 2,278 hectares of land. Also there are 3,500 wells which need repairs (Appendix 2.23). Table 2.24 shows increase in the irrigated area under different sources during the period 1968-74. The area under canal irrigation shows an increasing trend till 1973-74 but declines in the subsequent year. Tank and well irrigation shows erratic trend.

The distribution of the net irrigated area among all tehsils is shown in Table 2.25 which has largely remained constant over the years. Appendix 2.24 shows tehsilwise increase in the irrigated area by different sources which, by and large, follows the trend of the district.

The average net irrigated area during the triennium ending 1975-76 in Maharashtra State was 14,29,000 hectares as against the average net irrigated area of 1,12,170 hectares in Chandrapur district (Appendix 2.25). Percentage of net irrigated area to net sown area is 17.05 in the case of the State as compared to 7.95 per cent of the district (Table 2.26). The tehsilwise growth of net and gross irrigated area is given in Appendix 2.26.

The recent statistics on irrigation potential and its utilization for major, medium and minor projects present a rosy picture. The percentage utilization of Kharif has increased from 80.01 in 1977-78 to 82.14 in 1978-79 in case of major projects. For medium projects similar trend is observed, the corresponding figures for the two years being 73.13 and 79.12 per cent. In case of minor projects also the figure is more than 64 per cent. The overall percentage for the district for Kharif comes to 89 per cent which remains stagnant between the two points of time. For Rabi the potential figure can-

TABLE 2.25 TEHSILWISE PERCENTAGE OF NET IRRIGATED AREA IN CHANDRAPUR

<i>Tehsil</i>	<i>Percentage net irrigated area</i>
(1)	(2)
Chandrapur	23.4
Warora	13.3
Brahmapuri	31.6
Gadchiroli	28.6
Sironcha	2.5
Rajura	0.6
Total	100.0

TABLE 2.26 DISTRIBUTION OF NET IRRIGATED AREA (AVERAGE OF 3 YEARS, 1973-74 TO 1975-76) IN CHANDRAPUR AND MAHARASHTRA

(in '000 hectares)

Item	Net irrigated area	
	Chandrapur	Maharashtra
(1)	(2)	(3)
Canal	23.07 (7.95)	290 (100.00)
Tank	83.10 (38.47)	216 (100.00)
Well	2.50 (0.30)	815 (100.00)
Others	3.50 (3.24)	108 (100.00)
Total net irrigated area	112.17 (7.84)	1,429 (100.00)
Net sown area	658 (3.65)	17,985 (100.00)
Percentage of net irrigated area to net sown area	17.05	7.95

SOURCE: Season & Crop Reports, Maharashtra, 1973-74 to 1975-76.

NOTE: Figures within brackets are percentage to total.

not be estimated properly due to technical factors which give erroneous results.

Groundwater potential

Under the International Development Association's programme for Maharashtra Credit Project, the Groundwater Surveys and Development Agency was entrusted with the task of carrying out groundwater assessment for the entire State of Maharashtra. Table 2.27 shows the total number of additional irrigation wells that are feasible in the district. The number is 74,167. For arriving at tehsilwise and block level figures, Fig. 2.9 showing watersheds has been utilized (Appendix 2.27). Tehsilwise break-up is obtained by adjusting number of wells in a given watershed according to areas of different tehsils falling in that watershed.

It should be borne in mind that groundwater resources shows much less fluctuations than tank water in terms of availability over the years. Hence, a shift to tubewell irrigation will mean not only a quantitative but also a qualitative improvement in irrigation in the district.



FIG. 2.9

AGRICULTURE AND ALLIED SECTORS

The dominant activity for the population of this district is predictably agriculture, 80 per cent of the working population being engaged in it. However, if we look at the land use pattern activity of this district, we find that only 56 per cent of the total geographical area is under forests (Appendix 2.28). And of the cultivable land, only about two-thirds is net sown area. Thus, there is a scope, without any major technical innovation, to expand the agricultural economy extensively as the population demand-pull factors affecting agricultural output come into play.

TABLE 2.27 GROUNDWATER POTENTIAL IN CHANDRAPUR

<i>Sl. No.</i>	<i>Name of block</i>	<i>Name of tehsil</i>	<i>Proposed number of mechanical wells</i>	<i>Additional area to be irrigated (in hectares)</i>
(1)	(2)	(3)	(4)	(5)
1.	Chandrapur	Chandrapur	3,344	6,687
2.	Mul	Chandrapur	2,988	5,975
3.	Gondpipri	-do-	3,370	6,740
	Total of Tehsil	-do-	9,701	19,402
4.	Brahmapuri	Brahmapuri	990	1,980
5.	Nagbhid	-do-	2,142	4,284
6.	Sindewahi	-do-	3,522	7,044
	Total of Tehsil	-do-	6,654	13,308
7.	Sironcha	Sironcha	3,245	6,490
8.	Aheri	-do-	7,323	14,646
9.	Yetapalli	-do-	11,223	22,446
	Total of Tehsil	-do-	21,791	43,582
10.	Gadchiroli	Gadchiroli	3,202	6,404
11.	Armori	-do-	3,469	6,938
12.	Dhanora	-do-	4,054	8,108
13.	Chamorshi	-do-	6,760	13,520
14.	Kurkheda	-do-	3,227	6,454
	Total of Tehsil	-do-	20,712	41,424
15.	Warora	Warora	3,490	6,980
16.	Chimur	-do-	3,563	7,126
17.	Bhandak	-do-	3,659	7,318
	Total of Tehsil	-do-	10,712	21,424
18.	Rajura	Rajura	4,597	9,194
	Total of Tehsil	-do-	4,597	9,194
	Total of Chandrapur District		74,167	1,48,334

Area under Cultivation

The degree of intensive cultivation in the district is very low as is reflected in the cropping intensity which is merely 108.54 per cent. Double cropping is related to the availability of irrigation facilities, mainly from tanks. The paddy fields retain sufficient moisture after the summer monsoon to enable cultivators to take a second crop of wheat, gram or linseed. The district has got a large number of small tanks which are locally named as 'bodies'. These tanks are only able to irrigate the paddy crop in the Kharif season and are used as a protective measure. Double irrigated crops are not often feasible and the second crop is generally taken in the irrigated area of paddy fields. Table 2.28 gives tehsilwise cropping intensities.

TABLE 2.28 TEHSILWISE GROWTH IN THE PERCENTAGE OF GROSS SOWN AREA TO NET SOWN AREA IN CHANDRAPUR

Sl. No.	Tehsil	Percentage of gross sown area to net sown area	
		1960-61	1974-75
(1)	(2)	(3)	(4)
1.	Chandrapur	106.33	105.18
2.	Warora	102.17	103.17
3.	Brahmapuri	127.03	126.43
4.	Gadchiroli	112.81	118.31
5.	Sironcha	101.33	101.12
6.	Rajura	100.00	100.11
District Total		107.76	108.54

It can be seen in the above table that there is no significant improvement in the intensification of sowing over the past 14 years except in Gadchiroli tehsil. The percentage of net irrigated area to net cultivated area also rose only marginally from 15.88 in 1960-61 to 16.63 in 1974-75 in the district as a whole (Table 2.29). Double cropping appears to be more in paddy growing tehsils as in Brahmapuri and Gadchiroli the two paddy growing tehsils of the district, the cropping intensity is higher than the district average. However, in the tribal tehsil of Sironcha which too is mainly paddy growing, double cropping does not appear to be practised.

As is the case in underdeveloped subsistence farming of Bastar, Chandrapur mainly grows food crops and has 80.12 per cent of the gross cropped area under food crops in the year 1974-75. It is seen from Table 2.30

that absolute as well as percentage of area under food crops have generally fallen in the district since 1960-61, the trend being different from what was observed in case of Bastar. The percentage of area under food crops, decreased in all the other tehsils except Brahmapuri over the period 1960-61 to 1974-75.

TABLE 2.29 TEHSILWISE GROWTH IN THE PERCENTAGE OF NET CULTIVATED AREA IN CHANDRAPUR

Sl. No.	Tehsil	Percentage of net irrigated area to net cultivated area	
		1960-61	1974-75
(1)	(2)	(3)	(4)
1.	Chandrapur	20.52	20.64
2.	Warora	7.21	7.18
3.	Brahmapuri	42.12	39.86
4.	Gadchiroli	22.65	30.14
5.	Sironcha	5.50	5.42
6.	Rajura	0.15	0.17
District		15.88	16.63

TABLE 2.30 TEHSILWISE GROWTH IN THE PERCENTAGE OF FOOD AND NON-FOOD CROPPED AREA TO TOTAL AREA IN CHANDRAPUR

Sl. No.	Tehsil	Percentage of food cropped area to total cropped area		Percentage of non-food cropped area to total cropped area	
		1960-61	1974-75	1960-61	1974-75
(1)	(2)	(3)	(4)	(5)	(6)
1.	Chandrapur	87.69	83.31	12.31	16.69
2.	Warora	71.69	67.77	28.31	32.23
3.	Brahmapuri	96.44	97.08	3.36	2.92
4.	Gadchiroli	96.08	91.87	3.92	8.13
5.	Sironcha	94.34	86.77	5.66	13.23
6.	Rajura	66.88	62.15	33.12	37.85
District		84.27	80.12	15.73	19.88

The percentage of area under paddy has increased in Chandrapur, Warora, Brahmapuri and Rajura tehsils while that under jowar increased in Brahmapuri and Gadchiroli tehsils during 1960-61 to 1974-75 (Table 2.31). The proportion of area under cotton and oilseeds shows an increase over this period (Table 2.32).

TABLE 2.31 TEHSILWISE GROWTH IN THE PERCENTAGE OF FOOD CROPPED AREA TO GROSS CROPPED AREA IN CHANDRAPUR

Sl. No.	Tehsil	Year	Percentage of food cropped area to gross cropped area					
			Rice	Jowar	Wheat	Total cereals	Total pulses	Total food grains
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Chandrapur	1960-61	24.56	45.05	2.72	72.57	13.42	85.90
		1974-75	25.56	43.13	1.25	70.18	10.58	80.77
2.	Warora	1960-61	9.18	35.23	14.26	58.67	10.42	69.09
		1974-75	9.95	30.68	11.29	51.93	12.59	64.52
3.	Brahmapuri	1960-61	49.77	16.84	4.14	70.89	24.10	94.99
		1974-75	52.52	17.72	5.72	76.71	18.93	95.57
4.	Gadchiroli	1960-61	60.64	12.79	2.08	77.82	16.93	94.75
		1974-75	48.41	16.46	2.73	71.67	19.44	91.11
5.	Sironcha	1960-61	59.76	23.83	0.13	86.73	6.74	93.47
		1974-75	53.62	22.31	0.08	79.82	5.90	85.72
6.	Rajura	1960-61	2.62	39.02	3.54	45.77	18.20	63.97
		1974-75	3.58	35.42	4.48	43.09	16.61	59.62
	District	1960-61	31.11	29.64	5.79	67.33	15.02	82.35
		1974-75	28.55	28.77	5.09	63.65	14.31	77.96

There is a marked difference in the cropping pattern of eastern tehsils of the district. While Brahmapuri, Gadchiroli, Sironcha and Chandrapur tehsils have more than 83 per cent of the gross cropped area under food crops, in Rajura and Warora it is much below the district average (80.12). This is primarily due to the fact that Warora and Rajura tehsils are the rain shadow areas where cotton and oil seed are the major non-food crops. It is also observed that the shift of area from food crops to non-food crops or *vice versa* in different tehsils over the years are marginal and can be experienced in terms of annual variation in rainfall.

About 31 per cent of the total arable area or 2.3 lakh hectares is under paddy. Almost whole of this paddy is Kharif crop. The main varieties cultivated are Luchai and Jaya. About 42,000 hectares are covered under

TABLE 2.32 TEHSILWISE GROWTH IN THE PERCENTAGE OF NON-FOOD CROPPED AREA TO GROSS CROPPED AREA IN CHANDRAPUR

Sl. No.	Tehsil	Years	Percentage of non-food cropped area to gross cropped area		
			Cotton	Oilseeds	Other non-food crops
(1)	(2)	(3)	(4)	(5)	(6)
1.	Chandrapur	1960-61	0.26	11.92	0.13
		1974-75	0.66	15.89	0.06
2.	Warora	1960-61	7.49	20.68	0.14
		1974-75	12.22	19.89	0.08
3.	Brahmapuri	1960-61	—	3.45	0.11
		1974-75	—	2.85	—
4.	Gadchiroli	1960-61	—	3.45	0.47
		1974-75	—	7.54	0.53
5.	Sironcha	1960-61	—	4.48	1.18
		1974-75	—	7.54	0.53
6.	Rajura	1960-61	14.26	18.05	0.91
		1974-75	20.52	16.55	2.74
	District	1960-61	3.02	11.55	0.36
		1974-75	6.15	13.36	0.25

high yielding varieties during 1974-75, a fall from the peak level of about 70,000 hectares in 1973-74. A total area of about two lakh and twenty thousand hectares is under jowar. The bulk of this (about 72 per cent) is rabi jowar grown largely as a fodder crop. The area under pulses amounts to about 1,00,000 hectares or 15.5 per cent of the cultivable area. The main pulses grown are lac, tur and red gram. The area under oilseeds is 92,391 hectares and the area under cotton is 42,561 hectares. The main oilseeds grown are linseed and sesamum. The area under perishable products including sugarcane is negligible and does not exceed 1 per cent of the cropped area. Thus the cropping pattern appears to be in accordance with the needs of an under developed and non-commercialized agricultural region.

Productivity of Important Crops

As Table 2.33 and Appendices 2.29 and 2.30 clearly bring out, the areas and yields of different crops during the period from 1960-61 to 1974-75 have no systematic trend. Weather is possibly the only determinant of both the area sown and output obtained. The picture can best be

described as a stagnant one with considerable annual fluctuations both with respect to area and output. The area under HYV paddy is merely in the order of 20 per cent of the total paddy crop. In case of other crops, it is even less (Table 2.34).

TABLE 2.33 PRODUCTION OF IMPORTANT CROPS IN CHANDRAPUR

Sl. No.	Crop	Area (in hundred hectares)		Percentage increase (+) or decrease (—)	Outturn in hundred M. Tonnes		Percentage increase (+) or decrease (—)
		1960-61	1974-75		1960-61	1974-75	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Rice	2,054	1,990	(—) 3.11	1,559	1,313	(—) 15.78
2.	Wheat	382	381	(—) 0.26	154	247	(+) 60.39
3.	Jowar	1,257	2,294	(+) 17.22	919	1,052	(+) 14.47
4.	Total cereals	4,445	4,542	(+) 15.17	2,647	2,639	(—) 0.30
5.	Gram	101	149	(+) 47.52	30	69	(+) 130.00
6.	Tur	73	113	(+) 54.79	69	53	(—) 23.10
7.	Total pulses	991	1,081	(+) 9.08	293	346	(+) 18.08
8.	Total food grains	5,436	5,823	(+) 7.20	2,940	2,985	(+) 1.53
9.	Cotton	252	426	(+) 69.04	103	232	(+) 125.24
10.	Sesamum	451	333	(—) 26.16	84	70	(—) 16.67
11.	Linseed	303	270	(—) 10.89	71	52	(—) 26.76

TABLE 2.34 GROWTH IN AREA UNDER HIGH YIELDING/HYBRID VARIETIES OF DIFFERENT CROPS IN CHANDRAPUR

Name of crop	(in hectares)					
	1972-73		1973-74		1974-75	
	Target	Achievement	Target	Achievement	Target	Achievement
(1)	(2)	(3)	(4)	(5)	(6)	(7)
HYV Paddy	48,000	39,260	55,000	71,159	87,000	42,235
Hybrid Jowar (Kharif)	1,000	676	1,500	1,225	2,000	1,074
Hybrid Maize (Rabi)	12,000	1,057	1,500	842	12,000	899
HYV Wheat	500	168	500	120	300	150
Summer Paddy	1,000	3,333	2,000	5,665	43,000	9,309
Hybrid—4 cotton	1,000	2,425	20,000	8,258	11,000	620
Jowar 302 (kharif)	—	—	3,000	1,293	2,500	4,388
	—	—	—	—	1,000	42

SOURCE: Sheti Vishayak Pustika, April, 1975, Chandrapur district.

It may be noted that the distribution of cultivated area among different size groups is much more even compared to that of Bastar district. Only 7 per cent of the total land falls in the size group of 50 acres and above as against the corresponding figure of 50 per cent for Bastar. The average size of holding in Chandrapur thus works out to be much less compared to that of Bastar (Appendix 2.31).

Agricultural implements used in the district, by and large, comprise traditional wooden ploughs and bullock carts. There were nearly 1.79 lakhs of wooden ploughs in 1971. The bullock carts number 1.38 lakhs. Use of wooden as well as iron ploughs shows an increasing trend (Table 2.35). As for the use of improved tools, the number of sugarcane crushers had decreased from 370 to 224 during 1961-71. The number of oil engines and electric Pump set on the other hand increased six-fold during the same period. Tractors increased as much as twelve times, although its number per 100 hectares (and also of the pump sets) is far below the level of the developed districts of the State.

As per 1971 Census, the percentage of agricultural labourers to total workers in the district was 35.17. The data on agricultural wage rates have been collected from selected cultivators at three centres, viz., Kothari, Mul and Sindewahi in Chandrapur district. The annual average of wage rates for the year 1964 and 1975 collected from these three centres are shown in Table 2.36. It is seen from the table that agricultural wage rates of male and female workers indicate a noticeable increase at all the Centres in the year 1975 over 1964. The large increase in the wage rate of agricultural workers at Kothari may be due to the fact that it is surrounded by the cash crop area of chillies and cotton. In case of Mul this can be attributed to the level of urbanisation.

The agricultural prices, however, show a far greater increase during the period. As may be seen in Table 2.37, the prices of agricultural commodities have risen three-fold but the agricultural wages have only doubled. The fall in the real income of the agricultural workers unfortunately cannot be determined precisely from the above data. However, it is possible to argue that the economic condition of the agricultural worker has fallen relatively to either the land-owner, the merchant or both.

ANIMAL HUSBANDRY

Chandrapur district has the largest cattle population in Maharashtra accounting for about 7 per cent of the State figure. The high animal population of Chandrapur district coupled with the grazing resources available would justify the need to develop the animal husbandry sector in the district.

TABLE 2.35 GROWTH OF AGRICULTURAL IMPLEMENTS IN CHANDRAPUR, 1961-71

Sl. No.	Name of tehsil	Year	Ploughs		Carts	Sugarcane crushers	Oil engines with pumps for irrigation purposes	Electric pumps for irrigation	Tractors	Ghanis
			Wooden	Iron						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.	Chandrapur	1961	35,131	26	24,940	58	45	4	—	10
		1971	37,081	156	25,817	29	179	107	27	5
2.	Warora	1961	33,183	201	25,842	9	25	15	2	4
		1971	32,228	486	27,888	3	292	110	145	7
3.	Brahmapuri	1961	29,785	69	20,091	228	45	1	7	15
		1971	33,902	247	24,216	152	200	100	37	1
4.	Gadchiroli	1961	48,291	100	32,572	65	30	—	10	4
		1971	58,345	487	34,495	39	247	26	37	—
5.	Sironcha	1961	19,224	19	11,723	10	27	—	1	13
		1971	25,846	221	13,747	1	29	7	1	—
6.	Rajura	1961	14,126	12	9,820	—	2	1	—	—
		1971	16,330	62	12,429	—	30	27	—	—
District Total			1,79,740	427	124,988	370	174	21	20	46
			2,03,732	1,659	1,38,592	224	977	377	247	11

SOURCE: Socio-Economic Review and District Statistical Abstract of Chandrapur District, 1962-63 and 1963-64 and 1975-76, Bureau of Economics and Statistics, Government of Maharashtra, Bombay.

TABLE 2.36 GROWTH IN AGRICULTURAL WAGE RATES IN CHANDRAPUR

Name of centre	Average agricultural wage rates (Rs.)				Percentage (+) increase	
	1964		1975			
	Male	Female	Male	Female	Male	Female
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kothari	1.78	0.89	3.51	2.90	(+) 108.43	(+) 225.84
Sindewahi	2.03	1.03	3.33	2.13	(+) 64.04	(+) 109.80
Mul	2.11	0.87	4.08	2.13	(+) 93.36	(+) 144.83

TABLE 2.37 PRICES OF MAJOR COMMODITIES IN CHANDRAPUR

Commodity	Average yearly price (Rs.) per kg.		Percentage increase
	1963	1975	
(1)	(2)	(3)	(4)
Rice (Luchai No. 1)	0.67	3.33	(+) 382.09
Wheat (medium)	0.63	2.18	(+) 246.03
Wheat (course)	0.52	1.98	(+) 280.77
Gram	0.60	2.51	(+) 318.33
Arhar (tur)	0.92	2.50	(+) 171.74
Moong	0.73	2.87	(+) 293.15
Udad	1.02	2.85	(+) 179.41
Masur	0.75	2.27	(+) 202.67
Sugar	1.28	4.67	(+) 264.84
Gur	0.95	2.26	(+) 137.89
Groundnut oil	2.04	8.48	(+) 315.09
Meat	3.08	10.00	(+) 224.67

The population of cattle and buffaloes of various age groups is shown in Appendix 2.32 revealing the following interesting features in its distribution:

- (i) Over 45 per cent of the cattle population consists of adult males. The availability of adult males for ploughing is approximately one adult for over 0.7 hectares of cultivated land as against the State figure of one male for three hectares.
- (ii) The requirement of working cattle for Chandrapur district has

been estimated at 2.7 lakh as against the actual population of about 4.7 lakh.

- (iii) The estimated average yield of milk per breeding animal in the case of cow and buffalo is 60 and 360 litres per lactation respectively which is extremely low.
- (iv) Growth of bovine population shows an increase from 1961 to 1971 except that the number of male buffaloes over 3 years have fallen during this period in the district. Except Sironcha and Rajura tehsils this decline is evident in all the tehsils.

Production of milk in Chandrapur presuming 60 litres per lactation for milch cows and 360 litres per lactation for milch buffaloes is estimated at 144.5 lakhs litres per annum. The actual collection and sale of milk in Chandrapur district by traders and farmers and the collection of milk by the Dairy Development department have been estimated as at about 16 lakhs litres or 11 per cent of the estimated production. It is reported that in certain tehsils of Chandrapur specifically Gadchiroli, Sironcha and Rajura, farmers do not even fully milk their cows due to lack of adequate demand and also because of tribal customs.

It should be remembered that despite appropriate factor endowments, a thriving dairy industry is unlikely to take root in the district unless the government launches a concerted and integrated effort aimed simultaneously at improving the breed and hence lactation yields of the animal, and at providing a ready market at remunerative prices for the milk output. Improvements in the breed imply the castration of all animals not to be used for breeding, and reproducing new stock only through selected gene-stock and breeding bulls. In the initial stages, the government will have to incur large expenses in this breed improvement plan but later this cost can be recouped by buying the resultant extra milk at a price such that the profit make-up compensates for the earlier investment.

As will be seen in Appendix 2.32, the sheep and goat population has risen in the district during the period 1961-71. The sheep population, however, has declined in the State of Maharashtra as has been the case in some of the tehsils, *i.e.*, Gadchiroli and Warora of the district. This is largely because the goat mutton is priced higher than the sheep mutton. An estimate prepared by the Director of Animal Husbandry indicated that the income from a herd of 50 female sheep was about Rs. 4,000 as against an amount of Rs. 7,000 from a similar number of goats. Goat breeding today is largely carried out by tribals and small farmers for whom the goat is a source of milk for domestic consumption and also extra income.

The poultry population has risen during the period 1961 to 1971 by 8.49 per cent. This industry today is essentially functioning on traditional lines. The collection and marketing of poultry products depend on supplies

from Nagpur and Bombay which account only a small fraction of the total. This is because about 90 per cent of Bombay's consumption of chicken is met from the States of Andhra Pradesh, Karnataka and Kerala. Even Chandrapur and Nagpur are receiving eggs and poultry from Hyderabad.

Table 2.38 shows the growth of poultry birds per 100 households in Chandrapur district from 1961 to 1972. For the district as a whole it has decreased from 319 to 254. Increase is to be seen only in Warora and Rajura tehsils. The poultry keeping appears to be more popular in tribal tehsils, viz., Gadchiroli, Sironcha and Rajura. In almost all tehsils except Warora and Rajura, poultry birds per 100 households show considerable decline during the period 1961-72. The overall decrease is largely due to inadequate marketing facilities.

TABLE 2.38 GROWTH OF POULTRY PER 100 HOUSEHOLDS IN CHANDRAPUR, 1961-72

Sl. No.	Tehsil	Poultry per 100 households	
		1961	1972
(1)	(2)	(3)	(4)
1.	Chandrapur	270	181
2.	Warora	83	208
3.	Brahmapuri	275	212
4.	Gadchiroli	432	362
5.	Sironcha	384	317
6.	Rajura	258	309
District Total		319	254

FORESTRY

Forests of the mixed dry deciduous type cover 14,447 sq km of the total geographical area of 25,834 sq km in the district (mostly in eastern part) and form an important renewable natural resource. Most of the forest is concentrated in the eastern and southern part of the district, i.e., in Gadchiroli and Sironcha tehsils (Fig. 2.10 and Table 2.39). The forests are generally of the non-teak type, the common species being Ain, Dhawda, Garai, Tendu, etc. Teak output is small and scattered in space. The major teak yielding areas are the neighbourhood of Chandrapur, Markhanda, Allapalli, Somapalli and Jimalgatta. The production of timber in 1975-76 was 72,053 M³. Appendix 2.33 shows that fluctuations occur over the years in

the collection of forest products although the latter does not appear to be anywhere near the peak that can be harvested without the fear of deforestation.

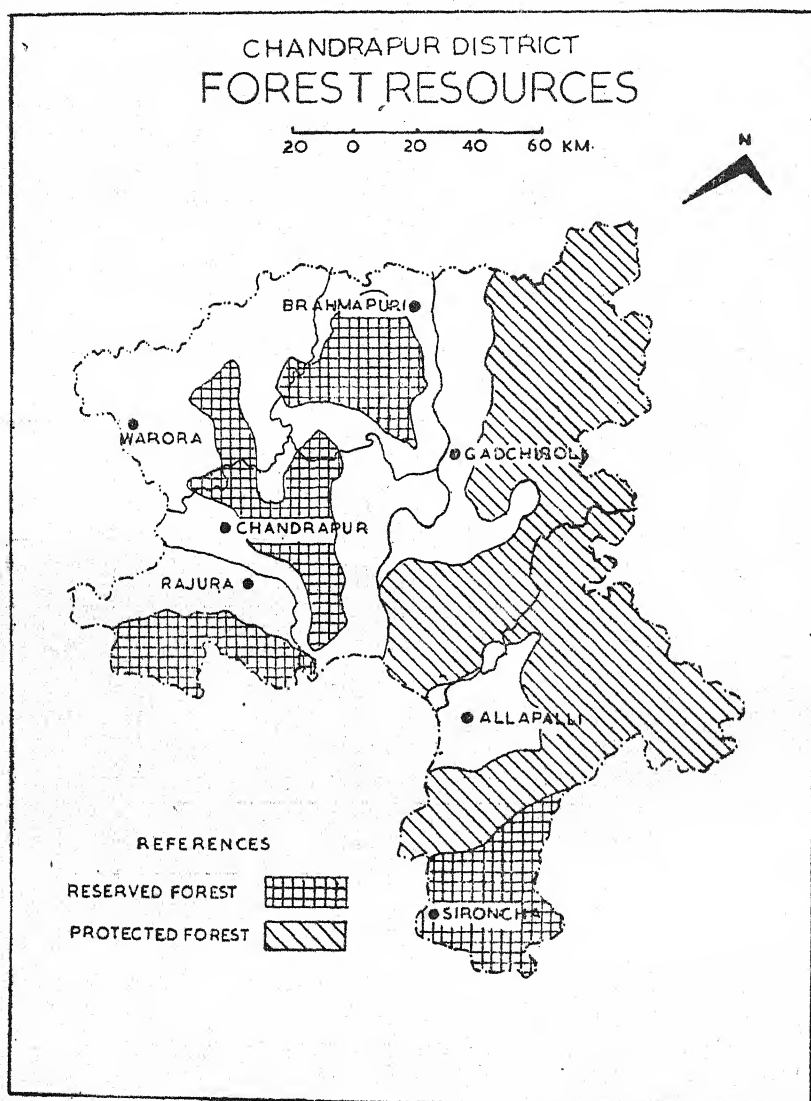


FIG. 2.10

It is estimated* that the annual production of timber can be of the order of 1,500,000 M³ (of which approximately 0.15 million M³ would be

*Based on Background Documents regarding Eco-system plan for the Development of Chandrapur District, Government of Maharashtra, Planning Department, 1977.

TABLE 2.39 DISTRIBUTION OF FOREST AREA IN CHANDRAPUR DISTRICT (AS ON 31ST MARCH, 1976.)

<i>(in sq km)</i>					
<i>Sl. No.</i>	<i>Forest division</i>	<i>Reserved forest</i>	<i>Protected forest</i>	<i>Unclassed forest</i>	<i>Total</i>
(1)	(2)	(3)	(4)	(5)	
1.	East Chanda	1,092.49 (56.47)	335.90 (20.13)	240.28 (14.40)	1,668.67 (100.00)
2.	West Chanda	1,898.02 (70.62)	591.07 (21.99)	198.69 (7.39)	2,687.78 (100.00)
3.	Central Chanda	1,193.37 (85.21)	200.33 (14.30)	6.81 (0.49)	1,400.51 (100.00)
4.	South Chanda	1,162.36 (40.77)	1,578.03 (55.35)	110.41 (3.87)	2,850.80 (100.00)
5.	Allapalli	1,478.31 (55.79)	1,164.68 (43.95)	6.81 (0.26)	2,649.80 (100.00)
6.	Bhiramgarh	Nil	3,824.65 (100.00)	Nil	3,824.65 (100.00)
District Total		6,824.55 (45.25)	7,694.66 (51.02)	563.00 (5.10)	15,082.21 (100.00)

timber, the balance being firewood) and 9,50,000M³ of firewood per year. The annual bamboo production is estimated to be 1,40,000 MT of which approximately 70,000 MT are supplied to Messrs. BILT (formerly Ballarpur Paper and Straw-Board Mills) and the balance is used by the local population and sold to outsiders. The existing production potential estimated to be 1.5 million M³ of wood could sustain a number of industries such as paper and pulp, rayon, wood working, saw-milling, etc. In addition, the forest area could be developed to grow more teak than at present, new crops such as mesta, medicinal plants and to increase the production of other timbers, fuel, bamboo, etc. This replanting would also create considerable employment potential within the district.

INDUSTRIES

There are not many industrial units in the district. Average daily employment of factory workers per thousand population works out to be 3.6 for the district which is nearly one/sixth of the State average figure in 1974. Not many units have come up in the district during the last decade. As against 48 registered (large and medium) units in 1960-61, there were only 50 units in 1969-70. The three important large units, viz., the Ballarpur

Paper and Strawboard Mills employing over 2,000 workers, the Associated Cement Companies factory at Ghugus, and the Bashir Oil Mill, Warora are the major landmarks in the private sector. The only public sector undertaking is the Defence establishment at Bhandak. Details regarding the registered 54 factories are given in Table 2.40. The data relate to only 44 industrial units as 6 units remained closed in 1974 and 4 units failed to furnish the requisite data.

TABLE 2.40 AVERAGE DAILY EMPLOYMENT OF WORKERS (FACTORY)
IN CHANDRAPUR, 1974.

<i>Sl, No,</i>	<i>Industry/sub-group</i>	<i>No. of working factories submitting returns</i>	<i>Total workers in cal. (3)</i>
(1)	(2)	(3)	(4)
1.	Manufacture of bakery products	8	43
2.	Manufacture of edible oils	1	135
3.	Manufacture of food products	2	30
4.	Cotton ginning, cleaning and baling	5	318
5.	Manufacture of veneer, plywood and other products	1	135
6.	Sawing and planing of wood other than plywood	5	209
7.	Manufacturing of wood, bamboo and cane products not elsewhere classified	1	5
8.	Manufacture of pulp, paper and paper board including newsprint	1	2,783
9.	Manufacture of paper and paper board articles not elsewhere classified	1	157
10.	Manufacture of basic industrial organic and inorganic chemicals	2	105
11.	Manufacture of structural clay products	11	397
12.	Manufacture of glass and glass products	2	471
13.	Manufacture of hard ware and porcelain ware	1	55
14.	Manufacture of cement, lime and plaster	1	821
15.	Manufacture and repair of non-electrical machinery	1	305
16.	Generation and transmission of electric energy	1	305
17.	Repair of motor vehicles	1	28
Total		44	5,999

SOURCE: Socio-Economic Review, District Statistical Handbook of Chandrapur District, 1975-76.

An analysis of the industry sub-groups shows that chemical and ceramics occupy a position of importance as compared to metal and engineer-

ring groups. This is but natural considering the deposits of industrial clays in the region. Even the small scale units are not numerous in the district. In 1971 there were less than 300 registered small units as per details given in Table 2.41.

TABLE 2.41 REGISTERED INDUSTRIAL SMALL UNITS IN CHANDRAPUR, 1971.

Sl. No.	Industry	No. of units		
		Registered	Provisionally registered	Total
(1)		(2)	(3)	(4)
1.	Mangalore and cement tiles	18	27	45
2.	Rice mills	6	4	10
3.	Saw mills	10	8	18
4.	Poha mills	6	2	8
5.	Furniture mart	4	8	12
6.	Engineering works and manufacture of spare parts	13	19	32
7.	Fabrication work	5	9	14
8.	Oil mills	2	17	19
9.	Plastic	1	3	4
10.	Chemical	3	9	12
11.	Soda factory and cold drinks	3	11	14
12.	Miscellaneous	13	57	70
Total		84	174	258

SOURCE: Industries Office, Chandrapur.

The pattern of distribution of small units falls in line with the factory sector. It may be noted that the agro-industries and chemicals have an edge over engineering units. The growth of small units in the district since 1961 is given in Table 2.42.

During the ten-year period, on an average, 26 units were registered annually. In addition, over 200 small units have remained as unregistered. There has been a seven-fold increase in the number of small units during a period of 10 years. What is surprising is that most of these units are located in the western part of the district, a substantial proportion of which is in Chandrapur town.

TABLE 2.42 YEARWISE GROWTH IN THE NUMBER OF SMALL UNITS REGISTERED WITH THE DIRECTORATE OF INDUSTRIES IN CHANDRAPUR, 1961 TO 1971

<i>Year</i>	<i>Number of units</i>	<i>Cumulative total</i>	<i>Index</i>
(1)	(2)	(3)	(4)
1961	37	37	100
1962	41	78	211
1963	14	92	250
1964	13	105	284
1965	12	117	316
1966	7	124	335
1967	16	140	378
1968	11	151	408
1969	16	167	452
1970	28	195	527
1971	63	258	697

ECONOMIC INFRASTRUCTURE

Transport System

The total road length in the district as recorded in March 1976 is 3,032.72 km the administrative break-up is given below:

State highway	997.01 km
Major district roads	592.36 km
Other district roads	215.23 km
Villages roads	1,223.12 km
Total	3,032.72 km

The road length per 100 sq km works out to 11.8 km for the district as against the State average of 58.06 km. There is no national highway passing through the district (Fig. 2.11). Table 2.43 gives the figures for road mileage per 100 sq km for 1961 and 1976.

Nearly 60 per cent of the existing road length is unsurfaced. The black topping programme proposed in the Fifth Plan, includes an outlay of Rs. 3,00,000 for Warora-Mandheli road, 17 km of which has already been commenced in the Fourth Plan period and an expenditure of Rs. 1,60,000 has been incurred. A sum of Rs. 1.9 million has been included in the Fifth Plan for black topping other roads, viz., Chandrapur, Ghugus, Bhandakchora and Bhandokghot and Nimbala roads.

To ensure efficient transport for smooth supply of raw material speci-

ally the perishable goods like, gum, mahwa seed, tuber, flower, etc., top priority should be given to roads in tribal areas.

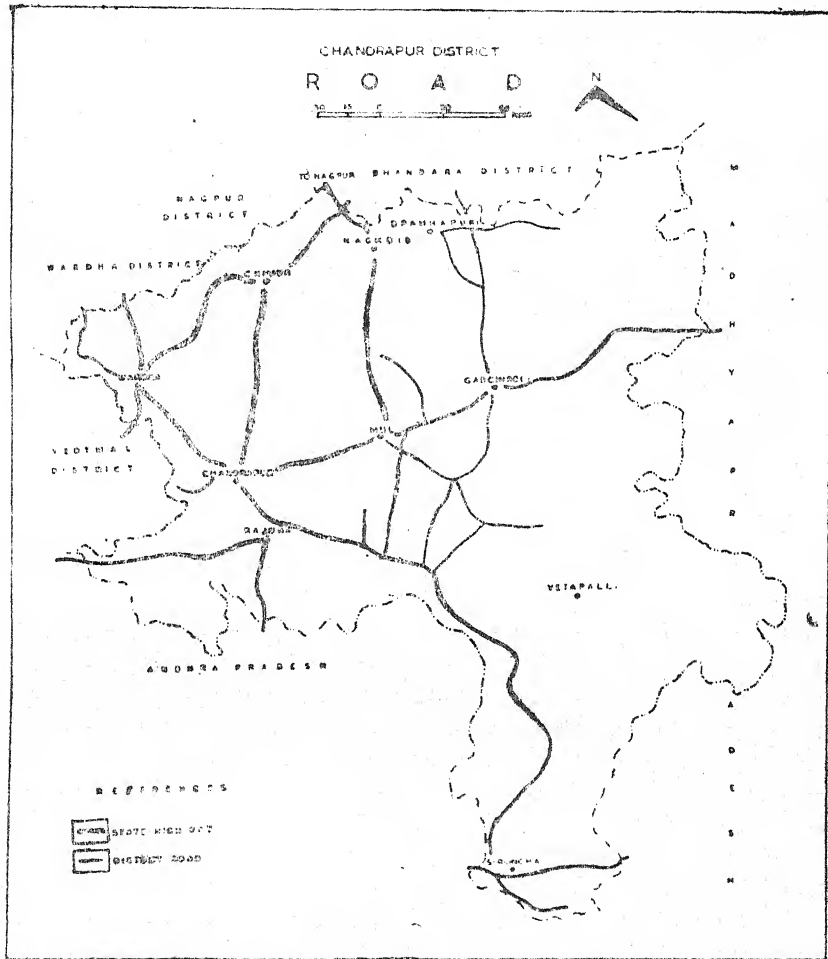


FIG. 2.11

The total railway route in the district as on March 1976 was 296 km out of which 141 km is broad gauge and 155 km is narrow gauge. In the broad gauge section 73 km is single line and the rest is double line. There is no railway in Gadchiroli and Sironcha tehsils. It is estimated that total goods traffic valued at Rs. 30 million approximately is carried by the railways per year in the district. The broad gauge section has an important link on the Delhi-Madras line via Nagpur. The narrow gauge railway which also connects Chandrapur with Nagpur and Jabalpur, mainly carries the forest wood and passengers. In addition to the main broad

gauge line there are a number of sidings serving the industries and coal mines. The most important siding connects Tadali to Ghugus.

TABLE 2.43 INCREASE IN ROAD MILEAGE (PER 100 Sq Km) IN CHANDRAPUR

Sl. No.	Category	Road length in km per 100 sq km	
		As on 31.3.61	As on 31.3.76
(1)		(2)	(3)
1.	Cement concrete	—	—
2.	Black topped	0.47	1.27
3.	Water bound mecadam	1.37	3.31
4.	Granular material	—	2.13
5.	Lower types	0.71	5.12
Total		2.54	11.83

Marketing

Efficient and fair marketing is a cornerstone of the development policy for this district. In this context it would be desirable to develop growth centres which would integrate different sectors of district economy at various levels of settlement hierarchy.

Chandrapur district has 18 block headquarters and in most of them adequate marketing facilities are available. It had 142 weekly markets in 1961 which rose to 180 in 1971. In Gadchiroli tehsil we find the largest concentration of weekly markets, the lowest concentration being in Sironcha though both are tribal tehsils.

Apart from these there are regulated markets each at Chandrapur, Mul, Warora, Brahmapuri, Nagbhid, Sindewahi, Gadchiroli, Armori and Rajura. Of these Warora is known for cotton marketing and the rest for the marketing of various agricultural produce. Evidently the weekly markets are not controlled as efficiently as the regulated markets. It is imperative that the relevant government agencies regulate the weekly markets at least during the harvest and sowing seasons.

Posts and Telegraphs

The Chandrapur Postal Division comprises two districts, viz., Chandrapur and Bhandara, the headquarters being at Chandrapur. The district is poorly served by the post and telegraph department. The number of telephone offices per lakh population is less than 2 as against 3 in the

country. The data on post and telegraph facilities for the year 1975-76 is given below:

	<i>Number</i>
Post Offices (Head)	2
Post Offices	292
Telegraph Offices	35
Public Call Offices	39
Telephone	1,060

The public call offices are located at all important centres like Chandrapur, Ballarpur, Mul, Warora, Bhadrawati, Naghbid, Sindewahi, Navalgaon and Sironcha. The number of post offices was 231 in 1961-62 which increased to 292 in 1975-76. Number of telegraph offices had gone up from 15 in 1961-62 to 35 in 1975-76.

MEDICAL FACILITIES

There are 4 hospitals, 84 dispensaries, 11 maternity homes, 18 primary health centres and 19 family planning centres in the district. Among the blocks, Chandrapur and Warora occupy a district position with two hospitals each (Appendix 2.34). Table 2.44 shows the growth of medical facilities over a period of past 15 years. During this period, the number of dispensaries had risen from 25 to 95 at the rate of 4 dispensaries per annum; whereas only one hospital could be established in the district during the period. Number of primary health centres have risen from 5 to 18. Beds per lakh population in 1960-61 rose to 39 in

TABLE 2.44 GROWTH OF MEDICAL FACILITIES IN CHANDRAPUR, 1960-61 TO 1975-76

<i>Facility</i>	<i>1960-61</i>	<i>1975-76</i>
(1)	(2)	(3)
Dispensaries	25	95
Hospitals	3	4
Primary Health Centres	5	18
Beds	190	633
Beds per lakh population	15	39
Patients treated		
outdoor	3,33,209	11,53,000
indoor	9,218	1,09,816
Birth rate (per '000)	N.A.	21.3
Death rate (per '000)	N.A.	8.1

1975-76. There has been also a substantial increase in the number of indoor patients.

EDUCATION

Educationally, the district lags much behind the Nagpur Division and the State. The following figures of literacy worked out on the basis of 1961 and 1971 Censuses amply prove this point (Table 2.45).

TABLE 2.45 GROWTH IN LITERACY (PERCENTAGE) IN CHANDRAPUR, 1961-71

Item	State		Nagpur division		Chandrapur district	
	1961	1971	1961	1971	1961	1971
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Males	41.04	51.30	41.06	49.80	28.58	38.70
Females	16.76	26.00	14.12	24.40	5.79	14.00
Persons	29.82	39.10	27.88	37.40	17.27	25.50

SOURCE: Socio-Economic Review and District Statistical Abstract of Chandrapur District 1968-69 and 1975-76.

During sixties, Maharashtra witnessed a qualitative change in the field of education, the impact of which was felt also in Chandrapur district. Table 2.46 shows the percentage increase in the number of students and institutions from 1960-61 to 1975-76. An increase of over 91 per cent in primary and over 137 per cent in secondary institutions over a period of 15 years is no mean achievement. Higher education in the district has also made a notable advance. During the period 1960-61 to 1975-76 the percentage increase was 600. The percentage of villages without primary educational facilities is, however, as high as 26. The teacher-taught ratio at this primary level on the basis of attendance is only 1:30. The ratio is 1:26 for middle and higher secondary level. Among the special educational institutions, mention may be made of the Industrial Training Institute at Chandrapur town which imparts training to motor mechanics, turners, wiremen, carpenters, fitters, etc., the Agricultural College at Warora and the Foresters' Training School at Chandrapur.

TABLE 2.46 PERCENTAGE INCREASE IN THE NUMBER OF STUDENTS
AND INSTITUTIONS IN CHANDRAPUR, 1960-61 TO 1975-76

Category	Years		Percentage increase
	1960-61	1975-76	
(1)	(2)	(3)	(4)
<i>Primary education</i>			
(i) Institutions	1,059	2,031	(+) 91.78
(ii) Students			
(a) Boys	54,110	1,12,343	(+) 107.62
(b) Girls	19,411	70,193	(+) 261.61
(c) Total	73,521	1,82,536	(+) 148.28
<i>Secondary education</i>			
(i) Institutions	61	145	(+) 137.70
(ii) Students			
(a) Boys	14,010	35,778	(+) 162.51
(b) Girls	2,919	17,025	(+) 483.25
(c) Total	16,929	53,803	(+) 217.81
<i>Higher education</i>			
(i) Institutions	2	14	(+) 600.00
(ii) Students	486	7,889	(+) 1,523.25

3

Credit Infrastructure in Bastar and Chandrapur

BASTAR

THE TRIBAL society of Bastar, intertwined with age old traditions in every fibre of its being, presents a unique example of cooperation and community living. The tribals of the district exhibit their cooperative spirit and sense of togetherness in most of their social activities. However, due to the low level of technology and high percentage of illiteracy this spirit has not been fully utilised in conducting their economic activities. After the merger of the erstwhile states of Bastar and Kanker into Madhya Pradesh, the formal cooperative movement gained momentum with the continuous guidance and help from the State authorities. The movement has been quite successful in agriculture specially in the distribution of credit but in other sectors this is yet to make a significant impact.

The principal financial institutions relevant in implementing the credit plan of a district are: (i) Commercial Banks, (ii) the District Central Co-operative Bank and the Cooperative Societies, and (iii) the District Co-operative Land Development Bank. Besides, Madhya Pradesh Audyogic Vikas Nigam Ltd., and the Madhya Pradesh Financial Corporation also provide term loans* to industries while the two existing and five proposed tribal development agencies are to provide financial assistance to tribals in their project areas by way of subsidies. The Agricultural Refinance Corporation provides finance in respect of term loans extended by the commercial banks and the Land Development Bank (LDB) which is a net addition to the resources of these institutions. LDBs also get about 10 per cent of their funds from the Government. Industrial Development Bank of India

*Loan provided generally for the purchase of agricultural implements or industrial machinery is repayable after a specific period.

provides finance to the commercial banks with regards to industrial credit. The District Central Cooperative Bank, on the other hand, gets a part of their sources from their Apex Bank.

Of the 32 blocks in the district, 19 are served by 26 offices of commercial banks which reflects the organizational strength of these banks. However, there are thirteen blocks without a commercial bank (although fourteen block headquarters are without banks) in the district. The number of banks in the district as compared to population works out to be reasonably high. Bastar has a bank per 59 thousand population while the State and all-India figures are 50 thousand and 30 thousand population respectively. However, considering areal coverage the picture appears to be highly unsatisfactory, the district figure being 1 bank per 10,000 sq km whereas eastern Madhya Pradesh has nine banks and the country has 43 banks for the same area. In the district, State Bank of India has 30 offices mostly located at the block headquarters. In addition, Punjab National Bank has 3, Dena and Union Banks have 2 each and Central, Canara and Bank of Baroda have 1 branch each in the district, the figures relating to July, 1979. The staff resources necessary for financing the various sectors of the economy and supervising the end-use of credit etc., are generally available at the 12 branches of commercial banks.

Table 3.1 shows the rate of growth of deposits in Bastar district as compared to all-India and State level figures. The average annual growth rate during the period, 1972-76 has been 31.52 per cent which is higher than the national and state figures. It may be noted that the rate of growth was high in 1973 in Bastar which became negative in the subsequent year. But after 1974 it has been steadily rising. More or less the same trend is seen in the case of national and state figures.

TABLE 3.1 RATE OF DEPOSITS GROWTH OF COMMERCIAL BANKS IN INDIA, MADHYA PRADESH AND BASTAR

	1972	1973	1974	1975	1976	Average
(1)	(2)	(3)	(4)	(5)	(6)	(7)
All India	—	17.42	7.95	18.09	28.42	23.96
Madhya Pradesh	—	14.74	6.23	24.87	34.92	15.29
Bastar District	—	55.00	-1.88	14.25	26.13	31.52

The growth trend of the deposits shows that if organizational factors do not act as a constraint and viable proposals are available for financing, commercial banks can raise their advances in the district at a much higher

rate than experienced in the past. It is unfortunate that the ratio of advance to deposit for the district works out to be very low. For every hundred—rupee deposited, only Rs. 17 are given as advance as against the figure of Rs. 89.6 for eastern Madhya Pradesh. The corresponding figure for Madhya Pradesh is also below 100 implying thereby that the amount of money withdrawn from the State is higher than advances given. An analysis of the trend of deposits and advances confirms the thesis of inter-regional transfer of resources. It may be seen that the advance-deposit ratio low as it was in 1971 declined further during the next five year period (Appendix 3.1), the figure touching a minimum of 11.9. Although in 1976 the figure shows some recovery, this does not leave much scope for optimism for future. The significantly higher figure of advance-deposit ratio for the State of Maharashtra when compared to Madhya Pradesh or Bastar lends further support to this thesis.

The rural-urban breakdown of the deposits and advances gives interesting insights. At the all-India level it may be seen that the cities have very high rates of advance to deposits which happens to be quite low for rural areas and smaller order towns (Appendix 3.2). This is a clear indication of syphoning of resources into the cities from their hinterland. In case of an under developed district like Bastar such a process is discernible, though in a modified form. Here the advance-deposit ratio is quite low both for rural as well as urban areas. Nevertheless, the figure is twice as high for towns as compared to the rural areas.

Appendix 3.3 gives the sectoral breakdown of the outstanding credit for commercial banks. While the all-India figure for the total outstanding credit is Rs. 14.04 per account, there are significant inter-state variations, the figure for Maharashtra being as high as Rs. 34.20 while the corresponding figure for Madhya Pradesh is only Rs. 9.20. Bastar ranks further down in the scale, the amount being Rs. 4.30. The sectoral classification shows that at all-India level the share of industries in the outstanding credit is 55 per cent while the figure for agriculture is less than 10 per cent. For Madhya Pradesh, agriculture share is twice as high as the national average although the share of industries remains more or less the same. On the other hand, the district of Bastar presents a contrast, the share of agriculture in its total outstanding credit being approximately 10 per cent although the share of industries is as low as 46 per cent. This suggests that while the credit availability for both agricultural and industrial development is highly inadequate, funds are available for tertiary activities like transport, storage, etc. This would reinforce the external orientation of the economy of Bastar which may be detrimental to its developmental potential in the long run.

Within the industrial sector, the small scale industries take about 78.7 per cent of the total outstanding credit in Bastar while the corresponding figure is very low for India and Madhya Pradesh. It shows that in the

district commercial banks do not finance significant investment in large or medium scale industries or basic economic infrastructure. Taking the case of electricity which is the focus of the present study the outstanding credit is almost zero during the period 1971-75 although the corresponding figure for the country as a whole is about 1 per cent.

BANKING INFRASTRUCTURE

Commercial Banks

Among the three commercial banks the State Bank of India (SBI) has evolved suitable organizational pattern to cope up with the financing of agriculture. Its Agricultural Development Branches and Agricultural Banking Divisions set up at various branches have an adequate complement of technically qualified field staff. Experience has shown that one Agricultural Development Branch can cover about 100 villages spread over one or two blocks while a branch with an Agricultural Banking Division can serve about 50 villages in the block of its operation. Branches without specialized staff can adopt about 5 to 10 villages each.

Of the 22 offices of the SBI, 11 are branches, 8 are sub-offices and 3 are satellite offices. Arrangements are already under way for upgrading Pakhanjore sub-office. Konta and Bijapur sub-offices will also be upgraded shortly into full-fledged branches.

It is a general policy of the SBI, to upgrade as many sub-offices as possible subject to the availability of business. In view of the special responsibility placed on it as the Lead Bank, it has taken a number of steps during 1976 and 1977 in upgrading such offices that have adequate development potential. These offices after upgrading have gone in for direct financing of agriculture in villages adopted by them. The bank is considering opening up of Agricultural Development Branches and setting up of Agricultural Banking Divisions after evolving a suitable working arrangement with the cooperative institutions and other banks.

State Bank is also considering to cover some of the rural centres with village branches under the charge of supervising officials. At these branches more emphasis will be placed on financing agriculture and rural industries.

Cooperative Institutions

District Central Cooperative Bank: The Cooperative movement in agriculture has reportedly covered every village in the district. Excepting the villages in Abujhmar block, the cooperative structure is made up of the District Central Cooperative Bank with its sixteen branches including the head office at Jagdalpur, 3 offices of the Land Development Bank, 2 Farmers Service Societies and 135 multi-purpose Cooperative Societies, some of which are defunct. The number of the societies was 236 in 1955-56 which rose up to 596 in 1960-61

and then came down to 405 in 1972-73 (Table 3.2) Due to poor recovery and huge amount of term loan and forged loan, these were reorganised to cover larger area and perform several other associated functions like supply of consumer goods, purchase of the produce, etc. At the moment there are 93 such societies and these are known as Large Area Multi-purpose Societies (LAMPS). These are encouraged to do non-credit operations. Now the District Central Cooperative Bank disburses mainly short and medium term loans to the farmers through these LAMPS. The average membership of the societies has risen considerably since the reorganisation the figures being 650 in 1977-78 as against 140 in 1972-73. These societies cover 50 to 100 villages and their area of operation extends from 100 to 150 km radius.

TABLE 3.2 ORGANIZATION AND FINANCIAL POSITION OF THE DISTRICT CENTRAL COOPERATIVE BANK IN BASTAR

<i>(Rs. in lakhs)</i>					
<i>Item</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i>	<i>1972-73</i>	<i>1977-78</i>
(1)	(2)	(3)	(4)	(5)	(6)
Societies	236	596	596	405	111
Membership	1,784	24,474	30,912	56,726	72,435
Share capital	0.33	3.12	9.20	17.84	23.79
Deposits	1.33	12.00	30.89	50.12	115.16

The membership or share capital is rising very slowly as can be seen from Table 3.3 whereas the deposits of the bank have increased steadily

TABLE 3.3 MEMBERSHIP AND DEPOSIT GROWTH OF THE BASTAR DISTRICT CENTRAL COOPERATIVE BANK

<i>Item</i>	<i>1971-72</i>	<i>1972-73</i>	<i>1973-74</i>	<i>1974-75</i>	<i>1975-76</i>
(1)	(2)	(3)	(4)	(5)	(6)
Membership	—	50,000	51,000	51,000	58,000
Deposits (in Rs. lakhs)	35.41	36.66	39.71	42.51	48.90
Rate of growth of deposits (%)	—	3.53	8.32	7.23	15.03

SOURCE: 1. Credit Plan for Bastar District, State Bank of India.
2. District Central Cooperative Bank, Jagdalpur.

by 3.53, 8.32, 7.23 and 15.03 per cent during the years from 1971-72 to 1975-76. The average rate of growth of the deposits during the period 1974-75 for Bastar is still higher and above the corresponding national figure (Table 3.4). From this one would infer that the growth of deposits in Bastar has been accelerated considerably during the seventies.

TABLE 3.4 GROWTH RATE OF DEPOSITS OF THE CENTRAL COOPERATIVE BANKS IN INDIA, MADHYA PRADESH AND BASTAR

	1974	1975	1976	Average rate of growth
(1)	(2)	(3)	(4)	(5)
India	—	12.07	22.30	17.18
Madhya Pradesh	—	16.23	17.80	17.01
Bastar District	—	17.92	17.61	17.76

The advance-deposit ratio for Bastar Central Cooperative Bank does not compare favourably with the all-India figure. It is expected that this bank in order to play a dominant role in promoting agricultural development would disburse more loans per capita in the backward areas. It may be seen that the average national figure is Rs. 119 per hundred rupee of deposits for the year 1976 which is much higher than the corresponding figure of the commercial banks (Appendix 3.4). Also we note that the figure for Madhya Pradesh, one of the most backward states of India is much higher than the corresponding figure for Maharashtra, the two figures being 149 and 119 respectively. The figure for Bastar, however, is disappointingly low. Here the total of the short and medium term loans rarely equal the deposits. This must be considered to be very low specially in view of the fact that the district economy is largely dependent on agriculture itself. The rates of growth of short-term and long-term loans during the three years ending 1976 for this bank have been fairly high both for India as well as for Madhya Pradesh. Bastar on the other hand seems to be suffering from the hazards of uncertainty leading to fluctuations in its figures. During 1974-75 the short-term advances felt drastically registering equally fantastic rate of growth during 1975-76 (Table 3.5). It may not be therefore wrong to infer that the credit system of this bank is yet to be stabilized in the district.

The primary societies in general, are financially weak, and are not managed efficiently. There has been no significant increase in their membership or share capital and deposits over the years (Table 3.6). The increase in their share capital or deposits is, therefore, expected to be only marginal

TABLE 3.5 GROWTH RATE OF SHORT-TERM AND MEDIUM-TERM ADVANCES THROUGH THE DISTRICT
CENTRAL COOPERATIVE BANK IN INDIA, MADHYA PRADESH AND BASTAR

(1)	1974			1975			1976			Average rate of growth	
	Short	Medium	(3)	Short	Medium	(5)	Short	Medium	(7)	Short	Medium
India	—	—	—	14.46	115.68	115.68	18.64	—17.10	—17.10	16.55	49.29
Madhya Pradesh	—	—	—	18.42	68.28	68.28	21.98	—64.54	—64.54	17.70	1.87
Bastar District	—	—	—	60.01	72.09	72.09	607.93	181.11	181.11	217.46	54.51

SOURCE: Banking Statistics, Basic Statistical Returns, Reserve Bank of India.

during the next few years. The financial resource position of the cooperative bank and the credits advanced by the societies (LAMPS) have been presented in Tables 3.7 and 3.8. It may be seen that there has been considerable fluctuation over the years with regards to working capital, borrowings and advances of the cooperative banking system which suggests that the operation of the cooperative banking institutions has not yet been stabilised in the district.

TABLE 3.6 SHARE CAPITAL AND DEPOSITS OF THE LARGE AREA MULTIPURPOSE COOPERATIVE SOCIETIES IN BASTAR

Item	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)
Share Capital (Rs. '000)	56,726	57,311	—	—	77,304
Deposits (Rs. '000)	115.38	115.54	—	—	157.62
Rate of growth (%) share capital	—	1.03	—	—	11.63
Rate of growth (deposits)	—	20.14	—	—	12.14

SOURCE: District Statistical Handbook, Bastar, 1977.

TABLE 3.7 FINANCIAL RESOURCES OF THE DISTRICT CENTRAL COOPERATIVE BANK IN BASTAR

(Rs. in lakhs)				
Item	1974-75	1975-76	1976-77	June, 1978
(1)	(2)	(3)	(4)	(5)
Share capital	19.59	20.78	22.68	23.79
Deposits	50.12	58.96	93.98	115.16
Borrowings (from apex bank and RBI)	43.66	56.69	65.76	33.72
Working capital	123.85	148.00	206.57	195.04

SOURCE: The District Central Cooperative Bank, Jagdalpur.

It is also evident that the bulk of the financial resources required for financing the development strategies of the district is to be generated through the commercial banks and not the cooperative banks. However, these banks cannot reach all the villages in the district due to the inadequacy in their organizational strength and coverage. The District Cooperative Banks together with their societies have a wider geographical coverage

TABLE 3.8 ADVANCES THROUGH THE LARGE AREA MULTI-PURPOSE SOCIETIES IN BASTAR

(Rs. in lakhs)				
<i>Item</i>	<i>1974-75</i>	<i>1975-76</i>	<i>1976-77</i>	<i>1977-78</i>
(1)	(2)	(3)	(4)	(5)
Advance outstanding	83.67	95.98	100.97	91.59
(a) Short term	53.79	66.88	74.77	66.41
(b) Medium term	32.97	29.10	26.20	100.97
Loan distributed	0.84	42.25	41.22	16.58
(a) Short term	0.83	40.06	30.59	14.64
(b) Medium term	0.01	2.19	10.63	1.94

although they are handicapped by lack of financial resources and management skills. The situation can be remedied if the commercial banks lend their management skills and financial resources to the Primary Agricultural Cooperative Credit Societies and Farmers Service Societies by affiliating the latter to some branches of commercial banks. In this way the commercial banks and cooperatives can complement each other in a meaningful implementation of the development plan for the district. It needs to be mentioned here that two Farmers Service Societies and three LAMPS have already been transferred to the commercial banks.

The District Cooperative Land Development Bank: The District Cooperative Land Development Bank (LDB) was established in 1967. It provides long-term loans for agricultural needs such as repairing wells, purchase of diesel and electric pump-sets, construction of tube wells, purchase of tractors, etc. The total lending of the LDB during 1973-74 was about Rs. 2.77 lakhs. It has six branches in the district, its head office being located at Jagdalpur. Efforts are being made to open branches of this bank at Bakawand and Jagdalpur. The membership share capital and deposits are rising continuously as may be seen from Table 3.9. The bank is also participating in the Agricultural Refinance Corporation programme for developing minor irrigation and can be expected to finance the credit requirement if its network of offices is strengthened.

Distribution of loans for the last five years by this bank is given in Table 3.10. The recent statistics of the credit advanced by the banks show fluctuating trend. The total advances rose from 9.82 lakhs in 1976-77 to 13.52 lakhs in 1977-78 which subsequently declined to 10.52 lakhs in 1978-79. The reason for the decline is the non-recovery of outstanding credit in 1977-78 which had imposed an upper limit to the proposed

advances during 1978-79. The subsequent recovery being fairly high (more than 75 per cent including 10 per cent from the Government funds) the bank has 'unlimited scope' for advancing loan for the year 1979-80.

TABLE 3.9 GROWTH IN MEMBERSHIP, SHARE CAPITAL AND DEPOSITS OF THE DISTRICT COOPERATIVE LAND DEVELOPMENT BANK IN BASTAR

Item	1972-73	1973-74	1974-75	1975-76
(1)	(2)	(3)	(4)	(5)
Membership	5,909	6,144	6,597	6,734
Share capital	99,286	1,06,824	1,35,858	1.64,379
Deposits (in Rs. lakhs)	17.86	18.62	22.75	24.20
Rate of growth in deposits (%)	—	4.25	22.18	6.37

SOURCE: The District Cooperative Land Development Bank, Jagdalpur, Bastar District.

Credit extension for minor irrigation and other schemes for agricultural development in the district envisaged in the credit plan is covered by re-finance from the Agricultural Refinance Corporation. The Agricultural Refinance Corporation normally gives about 90 per cent refinance in case of minor irrigation schemes and 70 per cent in case of other schemes. The Deputy Director of Agriculture prepared minor irrigation schemes for four blocks, *viz.*, Kanker, Charama, Saron and Bastar blocks for which refinance is available from the Agricultural Refinance Corporation. Finally, the Madhya Pradesh Apex Cooperative Bank is contemplating opening its offices in the district and efforts are being made to amalgamate some of the Primary Agricultural Cooperative Credit Societies into larger units. This has been already implemented in Dantewada and Konta blocks.

CHANDRAPUR

Until the beginning of the twentieth Century there were no formal credit institutions in the district of Chandrapur save the money-lenders. Although as purveyors of credit they played an important role and catered to the pecuniary needs of the people, but the exorbitant rates of interest and the various modes adopted by the money lenders in recovering loans strengthened the structures of a feudal economy. The practice continued till the 'business' of money-lenders was sought to be controlled

TABLE 3.10 DISBURSEMENT OF LOAN DURING THE LAST FIVE YEARS BY THE DISTRICT COOPERATIVE
LAND DEVELOPMENT BANK IN BASTAR

Years	Total loan disbursement (Rs. in lakhs)	New wells		Pumps		Well repairs		Others		Total	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1972-73	3.92	166	3.80	3	0.09	—	—	2	0.03	171	3.92
1973-74	1.56	29	1.30	8	0.24	—	—	1	0.02	38	1.56
1974-75	2.82	108	2.51	8	0.30	—	—	1	0.01	117	2.82
1975-76	2.03	92	1.42	14	0.58	—	—	2	0.03	108	2.03
1976-77	9.82	256	7.72	43	1.97	—	—	13	0.13	312	9.82

SOURCE: Bastar District Cooperative Land Development Bank Maryadit, Jagdalpur.

through legislations from time to time during the British period. Their influence in the financial sphere, however, diminished only with the emergence of the cooperative movement in this region after Independence. Commercial banking in the district started with the setting up of Allahabad bank unit at Chandrapur in 1953.

The major financial institutions for advancing credit for implementing various developmental plans in the district are: (i) Commercial Banks, (ii) District Central Cooperative Bank, and (iii) District Cooperative Land Development Bank. Most of the Commercial Banks of the district, viz., State Bank of India, Bank of India, and Bank of Maharashtra, Punjab National Bank, United Western Bank and Allahabad Bank advance loans for agriculture, small scale industries and other priority sectors. The others, namely, United Commercial Bank and Bank of Baroda presently advance loans mainly for small scale industries (Table 3.11). The District Central Cooperative Bank and District Cooperative Land Development Bank are meant for financing agricultural programmes. The district had 20 branches of commercial banks in the year 1968, the figure rising up to 55 by the end of December, 1978. The total deposits and advances of the commercial banks also show similar trend; the two figures increased from Rs. 4 crores and 2.1 crores in 1968 to 21 crores and 11 crores in 1978. The refinancing schemes for these commercial and other banks are same as that of Bastar.

BANKING INFRASTRUCTURE IN CHANDRAPUR

Commercial Banks

Of the 18 blocks in the district, three, viz., Dhanora, Kurkheda and Yetapalli have no office of any commercial bank until recently. However, they are now being covered by the State Bank of India. The number of banks in the district as compared to population works out to be quite high. Chandrapur has a bank for less than thirty thousand population while the all-India figure is slightly above it. The State Bank of India has 12 branches in the district some of which are located in remote block headquarters although the credit for opening the largest number of branches in the district goes the Bank of India, its number being thirteen. Bank of Maharashtra too has 12 branches in the district. The next in the order would be United Commercial Bank which has seven branches. Other commercial banks have one or two branches mostly in the district headquarter. As per the Reserve Bank of India reports, the deposits for the year 1975 are estimated as 989 lakh. The time profile of the deposits for the district clearly shows that there is an increasing trend, the average rate of growth being 40.86 per cent per annum (Table 3.12). It must be mentioned that the advances per 100 rupee of deposits in the year 1972 was very high for the district (the figure is above 100) even when compared to the figure for

TABLE 3.11 DEPOSITS AND ADVANCES POSITION OF THE COMMERCIAL BANKS IN CHANDRAPUR AS ON 30-4-1975

Name of bank	Total deposits	Total advances	Agricultural advances				S.S. Industries				Other priority sector advances			
			No. of A/cs		Amt. O/s		No. of A/cs		Amt. O/s		No. of A/cs		Amt. O/s	
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
State Bank of India	398.00	29.84	43	2.78	21	60.12	356	1.19						
Bank of Maharashtra	247.01	87.93	161	10.95	161	27.15	1,012	19.00						
Bank of India	63.30	27.72	397	13.67	27	1.61	260	8.87						
United Commercial Bank	9.50	0.63	—	—	1	0.13	8	0.10						
Bank of Baroda	110.00	38.81	—	—	13	3.85	6	1.68						
State Bank of Hyderabad	10.00	0.25	—	—	—	—	8	0.02						
Punjab National Bank	20.00	9.00	1	0.10	9	1.50	20	1.50						
United Western Bank	6.90	6.71	13	0.34	4	0.78	31	1.43						
Allahabad Bank	—	N.A.	—	N.A.	—	—	N.A.	N.A.						
Total	864.71	200.89	615	27.84	236	95.14	1,691	33.79						

SOURCE: Lead Bank Scheme Credit Plan for Chandrapur District, Maharashtra, (1976-78), Bank of India, Bombay.

SOURCE: Lead Bank Scheme Credit Plan for Chandrapur District, Maharashtra, (1976-78), Bank of India, Bombay.

Maharashtra (Rs. 81.20) which again is much higher than the national average of Rs. 69 (Appendix 3.1). The advances, however, have not gone up during the seventies and infact during the period 1974-75 they declined significantly. The advance-deposit ratio although very high in the early seventies declined significantly in the mid-seventies, the ratio coming down from 104.2 in 1972 to 56.89 in 1976. The advance-deposit ratio is higher for the urban areas, the figure being 60.5, while the corresponding figure for the rural areas is only 41.5 in 1976 (Appendix 3.2).

TABLE 3.12 RATE OF GROWTH OF DEPOSITS OF THE COMMERCIAL BANKS IN INDIA, MAHARASHTRA AND CHANDRAPUR

	1972	1973	1974	1975	1976	Average
(1)	(2)	(3)	(4)	(5)	(6)	(7)
India	—	17.42	7.95	18.09	28.42	23.96
Maharashtra	—	15.28	5.39	14.29	27.79	20.97
Chandrapur District	—	45.38	24.42	14.87	37.92	44.86

Appendix 3.3 gives the sectoral breakdown of the outstanding credit for the commercial banks. While the all-India figure for the total outstanding credits per account is Rs. 14.09 the figure for Maharashtra is Rs. 39.2. In case of Chandrapur district, it is as low as Rs. 10.72. The sectoral classification shows that at all-India level, the share of industries in the outstanding credit is 55 per cent while the figure for agriculture is less than 10 per cent. For Maharashtra, industrial-share is higher than the national average although the share of agriculture is significantly below it. Chandrapur district on the other hand, has the share of industries (81.1%) in its total outstanding credit much higher than the State figure but low in case of agriculture (5.5%).

Deposits of all the commercial banks operating in the district as per the credit plan prepared by the Lead Bank for the district (*i.e.*, Bank of India) stand at Rs. 864.71 lakh. The report of 30th April, 1975, however, does not give any trend over time (Table 3.12). The loans advanced at this time were of the order of Rs. 200.89 lakhs of which Rs. 27.84 lakh were advanced for agricultural purposes and Rs. 95.14 lakh was for small scale industries. Average of the agricultural loan advanced per person comes to Rs. 4,520 whereas for small scale industries it is Rs. 40,300.

Cooperative Institutions

District Central Credit Cooperative Bank: District Central Credit Cooperative Bank in Chandrapur with its 41 branches (1977-78) in the district

functions through the Primary Credit Societies. Table 3.13 shows blockwise distribution of these branches. The latter have not been reorganised in the fashion as the LAMPS of the Bastar district. These constitute the bulk of the cooperative societies, and cover almost all the villages in the district. The main function of primary agricultural credit societies is to advance short and medium term loans and cash credits for agricultural purposes (generally short-term) and redemption of old debt—both short and medium term (*i.e.*, not exceeding five years) loans to farmers within the area of their operation which is usually a village. In 1966 there were 1,204 societies, the number coming down to 1,184 in 1974-75 and then rising up again to 1,193 in 1975-76. The most recent figure is 1,325 in 1977-78. The working capital was 291 lakh in 1966 which increased to 729 lakh and 1,000 lakh in 1975-76 and 1977-78, respectively. Similarly the paid up share capital which was only 60 lakh in 1966 rose to 76.5 lakh and 97.35 lakh in 1975-76 and 1977-78 respectively. The deposits have also increased at an annual rate of about 10 per cent covering early seventies, the rate going above 25 per cent in 1975-76. In 1973-74 the deposits were of the order of 303 lakh which rose to 508 lakh in 1975-76 and went up to 565 lakh in 1977-78. The rate of growth, thus, works out to be higher than that of Maharashtra which, too, is above the national average.

TABLE 3.13 BLOCKWISE BRANCHES OF THE DISTRICT CENTRAL COOPERATIVE BANK IN CHANDRAPUR, 1977-78

<i>Sl. No.</i>	<i>Block</i>	<i>Number</i>
(1)	(2)	(3)
1.	Chandrapur	3
2.	Mul	4
3.	Gondpipri	2
4.	Warora	3
5.	Bhadrawati	2
6.	Chimur	4
7.	Brahmapuri	3
8.	Sindewahi	3
9.	Nagbhid	1
10.	Gadchiroli	1
11.	Armori	2
12.	Chamorshi	2
13.	Dhanora	1
14.	Kurkheda	3
15.	Sironcha	1
16.	Aheri	2
17.	Yetapalli	1
18.	Rajura	3
Total		41

The growth of the advances on the other hand shows fluctuations, the figures being 336, 458 and 230 lakh for the year 1973-74, 75-76 and 77-78 respectively. It is somewhat disturbing to note that while the paid-up share capital, reserve and other funds, deposits and working capital have all been rising, the advances declined phenomenally in 1977-78. This is primarily due to a low recovery and high outstanding credit in the earlier year. Besides, it is evident that due to several institutional constraints, demand for cooperative credit is not increasing at the desired pace (Appendix 3.5).

As has been mentioned above, the Primary Credit Societies are affiliated to the District Central Cooperative Bank, through which provision of finance is made. Table 3.14 shows the blockwise distribution of these societies in the district together with their working capital and loan disbursement.

TABLE 3.14 BLOCKWISE DISTRIBUTION OF THE PRIMARY AGRICULTURAL CREDIT SOCIETIES IN CHANDRAPUR, 1975-76

(Rs. in '000)				
Sl. No.	Block	No. of societies	Working capital	Loan advanced
(1)	(2)	(3)	(4)	(5)
1.	Chandrapur	69	23,11	18,15
2.	Mul	53	51,41	16,99
3.	Gondpipri	73	23,93	17,76
4.	Warora	82	1,05,27	1,18,04
5.	Chimur	77	22,26	47,32
6.	Bhadrawati	63	49,08	61,43
7.	Bramhapuri	91	18,80	32,93
8.	Nagbhid	81	36,92	21,52
9.	Sindewahi	73	19,25	11,52
10.	Gadchiroli	49	8,20	10,18
11.	Armori	82	28,23	16,26
12.	Kurkheda	74	13,01	8,70
13.	Chamorshi	81	4,27	5,99
14.	Dhanora	70	4,72	7,21
15.	Sironcha	31	1,28	2,28
16.	Aheri	37	3,99	2,74
17.	Yetapalli	31	58	46
18.	Rajura	76	33,32	20,66
District		1,193	5,71,88	4,53,26

District Cooperative Land Development Bank: There are 14 Land Development Banks in Chandrapur District (Table 3.15). These banks cater to the long-term credit needs of the agriculturists by granting loans for purchase of pump sets, construction of new wells and repair of old ones.

TABLE 3.15 BLOCKWISE BRANCHES OF THE LAND DEVELOPMENT BANK IN CHANDRAPUR

(1)	(2)
Chandrapur	Sindewahi
Mul	Gadchiroli
Gondpipri	Armori
Warora	Chamorshi
Bhadrawati	Sironcha
Chimur	Aheri
Brahmapuri	Rajura

Table 3.16 shows the pattern of loan disbursement over the years. In 1972-73 the loan advanced by these banks were of the order of Rs. 34.91 lakhs which rose to 106.78 lakhs in 1976-77. The loan advanced for agricultural pump sets declined continuously from 1973-74 to 1975-76, although it showed some recovery in the year 1976-77. On the other hand, loan for other agricultural activities generally shows a rising trend. Total agricultural loan advanced per person comes to Rs. 4,596 (considering only the people receiving loans) for the year 1975-76, while the average figure per village is Rs. 15,517. The most recent statistics on total advances, however, does not conform to the general trend observed in the seventies as may be seen below:

	<i>Units</i>	<i>Advances in Rs. lakh</i>
1976-77	2030	106.77
1977-78	1548	83.07
1978-79	1848	61.03

The reasons for this consistent decline during the recent two years is non-recovery of outstanding loans to which refinancing is tied. Excepting a couple of branches others have only limited resources from ARDC while one of them has been declared 'closed' for the purposes of additional resources (a closed branch gets a maximum of 2 to 3 lakh per year).

TABLE 3.16 LOAN ADVANCED IN CHANDRAPUR BY THE DISTRICT COOPERATIVE LAND DEVELOPMENT BANK

Years	Total loan advanced for agriculture pump-sets			Total loan advanced for other agricultural activities		
	No. of persons	No. of villages	Total amount (Rs.)	Loan per person	No. of persons	No. of villages
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1972-73	616	177	18,59,600	3,018	578	323
1973-74	575	185	19,72,000	3,429	1,688	377
1974-75	348	177	14,72,000	4,229	953	304
1975-76	206	176	9,84,348	4,778	1,412	371
1976-77	473	259	24,97,000	5,279	1,850	429
Total	2,218		87,84,940		6,481	
						2,76,07,638

SOURCE: The District Cooperative Land Development Bank, Chandrapur.

A NEW APPROACH TO INSTITUTIONAL CREDIT—THE CREDIT PLAN

Discussion on credit situation in the two districts would be incomplete without an analysis of the District Credit Plan (DCP) formulated as per the guidelines supplied by the Reserve Bank of India (RBI). The DCP is only an amplification of certain programmes included in the overall district development plan which in turn depends on the national plan. The objectives of the national plan thus effects the objectives of the DCP. The last DCPs were primarily intended to provide: (i) loans for labour intensive schemes, (ii) loans to increase land productivity, and (iii) loans to weaker sections as per the national objectives.

In accordance with the instructions from RBI, the State Bank of India and Bank of India prepared credit plans for Bastar and Chandrapur respectively for three years ending December 1979. The credit plan is divided into three sectors: (i) agriculture, (ii) industry, and (iii) social services. The schemes allot targets to different Nationalised Commercial Banks as well as to the Cooperative Banks and LDBs. It also gives blockwise breakdown of credit on the basis of the development potential, infrastructural facilities, present lending patterns, etc., in different blocks.

Agricultural schemes in the plan include finance for irrigation, crop loans, mechanisation of farms, gobar gas plants, development of dairy, poultry, goat, sheep, fisheries, etc. The industrial schemes include various small scale industries based on forest produce and other local raw materials. The social sector schemes include services like retail trading, transport, medical services, etc. A task force comprising representatives of various banks and governmental departments with an officer from the lead bank is generally responsible for the preparation of the plan. A District Level Consultative Committee is formed to review the implementation of the credit plan and coordinate the activities of various financing institutions with those of the developmental agencies in the district.

The Credit Plan was initially designed as co-terminus with the Fifth Five Year Plan. However, because of delays in (credit) plan formulation and other teething troubles, the plan could be launched only by the end of 1976. Thus the first Credit Plan became operational for the three year period from January, 1977 to December, 1979.

An analysis of the achievements of the Credit Plan in Bastar gives mixed impression. First point to be noted is that the actual commitments made by all the banks put together comes to be less than 50 per cent of the estimated demand for credit as per the plan which implies lowering down the targets. Besides, for agriculture the commitment is only 40 per cent which is lower than the corresponding figures for industries and services. The reasons for lowering down the targets are given as late start and some initial problems with the commercial banks in the district. However, even with the revised targets performance does not appear to be satisfactory. In

agriculture the achievement is 56 per cent of the commitment when the figures for the Central Cooperative Bank are included. The achievement of the latter is 150 per cent mainly due to non-recovery of loans and interest later. Excluding the share of the Central Cooperative Bank, the achievement in agricultural sector is less than 20 per cent (Appendix 3.6). In case of industries, the performance is much worse, the achievement being only 3.7 per cent. In case of services the achievement is 50 per cent and this is mainly due to the urban orientation and less uncertainty in this sector. The figures for State Bank of India relating to its performance in June, 1978 show that it is doing much better in industries and services as compared to agriculture. The recent statistics corroborate this trend and this is more conspicuous in case of other commercial banks (Table 3.17). It is evident that in case of services both State Bank as well as other banks have over fulfilled their targets; for industries the achievement is about 60 per cent. In case of agriculture the figure comes down to 30 per cent for the SBI while for other commercial banks, it is even lower.

TABLE 3.17 PERFORMANCE OF BANKS WITH REGARD TO THE CREDIT PLAN IN BASTAR, 1978

(Rs. in thousand)

	<i>Agriculture</i>		<i>Industries</i>		<i>Services</i>		<i>Total</i>	
	<i>Commitment</i>	<i>Achievement</i>	<i>C</i>	<i>A</i>	<i>C</i>	<i>A</i>	<i>C</i>	<i>A</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Bank of India	6267	1856	791	502	1998	3285	9056	5642
Other banks	3530	4273	650	438	627	2131	4807	6842

Discussion with the bank officials of the district indicate that the same trend is likely to continue for the final year of the first Credit Plan. The Commercial Banks are generally neither willing to open their branches in remote rural areas nor prepared to make commitments for agricultural development where returns are uncertain.

In case of Chandrapur district the overall performance is much better than Bastar, the percentage figure being 91 upto 1978. However, there are significant inter-sectional variations among the banks in their performance. While the State Bank, United Commercial Bank, Bank of Baroda and Punjab National Bank have over fulfilled their targets, others lag behind. Punjab National Bank and State Bank of Hyderabad are the major defaulters in this district specially with regards to advancing agricultural credit. Even the Bank of India which is the lead bank gives the achievement figure

of 43 per cent. Besides, agriculture sector is once again the major casualty of this non-fulfilment of targets. In case of industries and services the achievements are more than three times the committed amounts while in agriculture the figure is barely 41 per cent (Appendix 3.7). The commercial banks show unwillingness to open branches in rural areas or take a big hand in disbursing agricultural credit. The main reason for non-fulfilment as pointed by the commercial banks are the low level of agricultural development, lack of infrastructural facilities including irrigation, storage, etc., and absence of entreprenuring farmers.

FUTURE PERSPECTIVE

In view of the weakness of the existing banking system specially with regards to agricultural development, some changes in the present organizational set-up is being contemplated for the next Credit Plan 1980-82, which is being prepared under the instructions from RBI. It is proposed that the Primary Cooperative Societies would be transferred on a larger scale to the commercial banks in order to strengthen their financial base and augment efficiency. It is also suggested that the commercial banks should adopt larger number of villages and the Land Development Banks should ask for no objection certificate from the adopter banks for financing in these villages. The commercial banks should not, however, restrict financing in adopted villages but should extend their functioning in other villages in their operation area. It is also proposed to start a larger number of Regional Rural Banks to cover the remote rural areas. It is proposed, for example, to set-up 38 branches of banks by 1982-83 in Bastar. It would be unrealistic to expect commercial banks to contribute in this venture. It is, therefore, expected that the RBIs which will function primarily for the development of the rural sector, should take the substantial share of the additional units.

4

Rural Electrification in Bastar and Chandrapur

BASTAR

ELECTRIFICATION, WHICH is considered crucial for regional economic development has not made much headway in Bastar, inspite of the efforts of the State Electricity Board and the Rural Electrification Corporation. Only 202 villages (6% of the inhabited villages), two towns and two industrial townships have been electrified so far. By March 1973 about 13.2 per cent of the villages in Madhya Pradesh were electrified but the percentage was only 3.5 in Bastar. The number of pump sets energised till March 1974 works out to about 374 per lakh of population in the State but in Bastar district it was as low as 62*. The per capita consumption of electricity is also very poor in the district, *i.e.*, 9.5 KWH as compared to the State figure of 55 KWH in 1971.

Bastar district, in fact, saw electricity as early as in 1930 when diesel power house at Jagdalpur in 1950 (and thereafter Kanker) was commissioned. The actual development started with the extension of grid supply from Orissa by 33 KV line from Jeypore to Jagdalpur in 1962. The Bhilai-Barsur-Kirandul 220/132 KV line was constructed and charged at 132 KV in 1968. Jagdalpur was connected from Kirandul in 1968 by 33 KV line. At the same time Kanker was connected from Bhanupratappur by 11KV which was already connected by 33 KV line from Balod during 1964-65. During this period, extension of the line to Kondagaon and Narayanpur was also done. The tehsil headquarters of Bijapur and Konta were electrified in 1968-70 by diesel sets.

*Draft Sub-Plan, Integrated Tribal Area Development in Madhya Pradesh, (1974-79) Department of Planning, Economics and Statistics,

POWER GENERATION

The main sources of power supply to the district are: (i) Orissa Electricity Board, and (ii) Madhya Pradesh State Electricity Board's thermal power generation unit at Korba. There is a proposal to establish seven power generating units in the district: (i) Chitrakot, (ii) Bodhghat, (iii) Kutru I, (iv) Kutru II, (v) Nugur I, (vi) Bhopalpatnam I and (vii) Bhopalpatnam II. The firm power and installed capacity of these units are shown in Table 4.1.

TABLE 4.1 PROPOSED POWER GENERATING UNITS IN BASTAR

<i>Name of power generating unit</i>	<i>Firm Power in (MW)</i>	<i>Proposed installed capacity (in MW)</i>
(1)	(2)	(3)
Chitrakot	7.36	3x5
Bodhghat	140.00	480
Kutru I	25.00	3x25
Kutru II	40.00	125
Nugur I	25.00	75
Bhopalpatnam I	262.00	525
Bhopalpatnam II	108.00	225

SOURCE: Madhya Pradesh State Electricity Board, Bodhghat.

At present Jagdalpur is connected to the power of Korba Grid Supply through Bhilai 230/132 KV sub-station. The number of power stations in the district with their power distribution capacity is shown in Table 4.2.

The extension of 33 KVA line to Pakhanjore and erection of 500 KVA (0.5 MVA) sub-station have been completed. Similarly under REC programme 33 KV line to Kuakonda—Sukma and 11 KV line to Chitrakote in Jagdalpur tehsil and Konta, Balpet, Tumnar, etc., in Konta, Dantewada, Kuakonda, Kanker and Charama blocks are also complete (Fig. 4.1). There is a proposal of constructing two sub-stations, one at Barsur and other at Kirandul. The installed capacity of these sub-stations will be 120 MVA and 12.5 MVA, respectively. Work is complete in the latter case.

Table 4.3 indicates the increase in the length of transmission lines over the years. The length of 33 KV lines has increased at the rate of 9.59, 11 KV lines at the rate of 22.23 and L T. lines at 10.60 per annum during the period 1971-77, the rate being calculated by averaging the annual growth rates.

TABLE 4.2 NUMBER OF POWER SUB-STATIONS IN BASTAR

<i>Name/place of power sub-station (S/S)</i>	<i>Voltage ratio</i>	<i>Capacity in MVA</i>
(1)	(2)	(3)
Kirandul Main	132/33 KV	1.5
Jagdalpur	33/11 KV	1.5
Bhanupratappur	33/11 KV	1.0
Dantewada	33/11 KV	0.5
Kuakonda	33/11 KV	0.5
Sukma	33/11 KV	0.5
Pakhanjore	33/11 KV	0.5
Jagdalpur (new location)	33/11 KV	1.6
Charama	33/11 KV	0.5
Kanker	33/11 KV	1.0

SOURCE: M.P.S.E.B., Jagdalpur.

TABLE 4.3 PROGRESS IN H.T./L.T. LINES ROUTE LENGTH KM IN BASTAR, 1971-72 to 1976-77

	<i>As on March '71</i>	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>H. T. lines</i>							
33 KV lines per cent growth rate	427.48	73.9 (17.29)	1.74 (0.35)	— (0.00)	— (0.00)	24.0 (4.77)	185.3 (35.15)
<i>Distribution lines</i>							
11 KV lines per cent growth rate	136.85	— (0.00)	43.50 (31.79)	26.88 (14.90)	— (0.00)	119.43 (57.65)	96.80 (29.64)
L.T. lines per cent growth rate	273.20	— (0.00)	41.25 (15.10)	11.72 (3.27)	24.86 (7.62)	86.03 (24.51)	57.40 (13.13)

SOURCE: M.P.S.E.B., Jagdalpur.

The distribution of electrified villages in different size categories is given in Table 4.4. It may be seen that there is a significant bias in favour of larger settlements which is expected. Although villages with less than 200 population have been electrified, their percentage share is relatively low.

Table 4.5 shows the increase in the number of villages electrified till September 1976 whereas its blockwise details are given in Appendix 4.6. The number of electrified villages is highest in Jagdalpur (90) followed by Kanker (51) whereas in Bijapur tehsil the number is lowest. The simple rate of growth (annual) in the number of electrified villages from 1969-70 to 1976-77 works out as 21.34 per cent for the district as a whole;

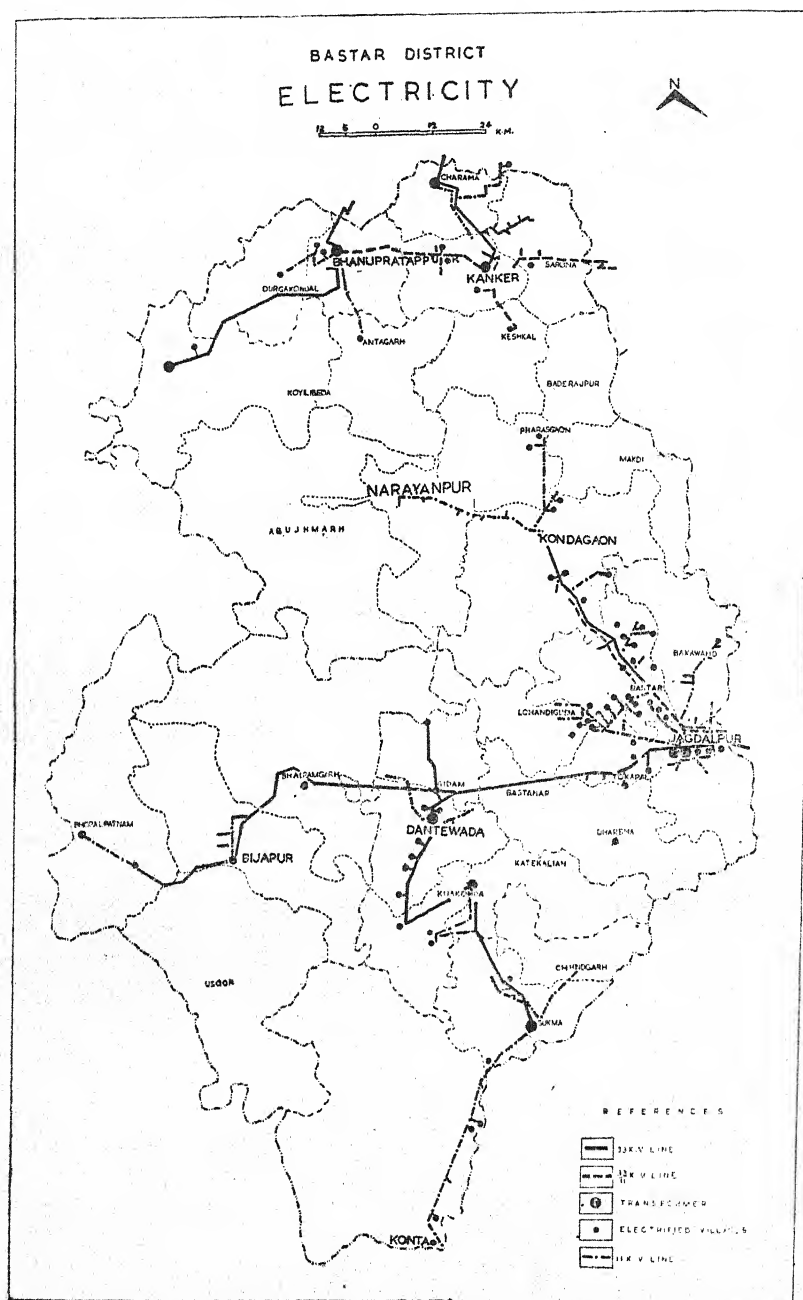


FIG. 4.1

TABLE 4.4 DISTRIBUTION OF ELECTRIFIED VILLAGES IN DIFFERENT SIZE CATEGORIES IN BASTAR

<i>Population Size</i>	<i>Number of electrified villages</i>	<i>Per cent of electrified villages</i>
(1)	(2)	(3)
Less than 200	16	7.92
200 — 500	50	24.75
500 — 1000	73	36.14
1000—2000	45	22.28
More than 2000	18	8.91
Total	202	100

whereas it stands at 138.74 per cent in case of agricultural pump sets energised during the same period (Table 4.5). It must be noted that all the blocks in Bijapur tehsil, Darbha block in Jagdalpur tehsil, Katekalyan in Dantewada tehsil, Pharasgaon, Makdi and Baderajpur in Kondagaon tehsil, Antagarh, Koilebeda and Abujhmar in Narayanpur tehsil are not electrified. Thus, of the total 32 blocks only 11 are unelectrified in Bastar district.

An attempt has been made (Appendix 4.1) to study the annual growth rate of the number of units under different categories of electricity consumption in the district from 1972-73 to 1976-77. Among all the electrified blocks, Narayanpur registered the highest annual growth rate in agricultural pumpsets, *i.e.*, 75 per cent, followed by Dantewada (53.57%). On the other hand, the growth rate of industries is highest in Durgkondal (37.5%) followed by Dantewada (31.25%). The growth rate is recorded as negative in case of Kondagaon between 1972-73 and 1976-77.

In case of industrial connections, the annual growth rate works out to be reasonably high. However, this is largely because of the low industrial base in the year 1972-73. The intra-block variation for this figure is also highly significant. An analysis of the pattern of electricity consumption among various usages, on the other hand, indicates that the industrial consumption has remained more or less stable or declined during the period. It appears that while the number of connections are increasing there is no corresponding growth of electricity load.

As compared to agricultural pump sets and industrial connections, the annual growth rate in domestic and commercial connections is very high. It is recorded as high as 700 per cent in Tokapal and 152.5 per cent in Bakawand of Jagdalpur tehsil. Percent increase in street lighting is highest

TABLE 4.5 NUMBER OF VILLAGES ELECTRIFIED AND AGRICULTURAL PUMP SETS ENERGISED IN
BASTAR UP TO 1976-77

Name of tehsil	1969-70		1970-71		1971-72		1972-73		1973-74		1974-75		1975-76		1976-77	
	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Jagdalpur	29	—	33	42	42	40	43	95	47	109	56	116	74	130	90	155
Dantewada	9	1	10	3	10	7	11	7	11	9	13	14	17	21	17	39
Konta	1	—	1	—	—	—	1	—	1	—	3	4	10	7	12	15
Bijapur	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—
Kondagaon	7	20	11	25	12	30	13	35	13	40	13	40	14	53	14	53
Narayanpur	3	1	3	1	6	6	7	9	7	14	7	34	7	34	7	36
Kanker	27	40	40	70	46	116	49	167	49	199	50	228	51	235	51	223
Bhanupratap- pur	4	—	7	—	10	16	10	33	10	34	10	36	10	36	10	36
District Total	81	52	96	140	128	215	135	346	139	405	153	472	184	516	202	557

SOURCE: MSEB, Jagdalpur. V=Village P=Agricultural pump set.

in Sarona (100%) in Kanker tehsil followed by Jagdalpur block (80.55).

GROWTH IN CONSUMPTION OR SALES OF ELECTRICITY

Table 4.6 shows increase in the consumption of electricity over the years. The growth rate of total consumption per annum comes to 21.14 per cent. The sale of electricity varies over the years. It shows a consistent increase throughout the period from 1971-72 to 1976-77. The total units sold from 1971-72 to 1976-77 are shown in Table 4.7. In 1976-77,

TABLE 4.6 GROWTH IN CONSUMPTION OF ELECTRICITY IN BASTAR

(in lakh kwh)						
Item	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sales by utilities	44.71	55.00	61.00	84.58	88.82	92.00
Consumption met by self-generating units	—	—	—	—	—	—
Total consumption	44.71	55.00	61.00	84.58	88.82	92.00
Simple rate of growth of total consumption per annum 1971-72 to 1976-77 (%)	—	—	—	21.15%	—	—

TABLE 4.7 CHANGES IN THE PATTERN OF ELECTRICITY SALE TO L.T. CONSUMERS IN BASTAR

(Rs. in lakhs)			
Item	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)
Domestic supply	8.32	8.74	7.31
Commercial	6.98	7.34	10.19
Agricultural pump sets	1.63	1.72	2.19
Industrial	6.65	6.98	4.61
Street light	0.89	0.72	0.71
Others	2.53	1.51	0.16

SOURCE: MPEB, Jagdalpur.

the value of the total units sold amounts to Rs. 92 lakhs. Except for commercial and agricultural usages the sale of electricity for all other sectors have gone down.

SOURCE OF FINANCE

For rural electrification the major sources of finance are Rural Electrification Corporation and agencies like Tribal Welfare Department and State Government.

It is seen in Table 4.8 below that REC started financing rural electrification schemes in the district in 1974-75. Here the first column gives the position as on March 1972 while the other columns indicate the increase over the years. Both in case of REC as well non-REC financed schemes, the growth pattern of the number of villages electrified is not consistent.

TABLE 4.8 ELECTRIFIED VILLAGES BY DIFFERENT SOURCES OF FINANCING IN BASTAR, 1971-72 TO 1976-77

Source of finance	Electrified during					
	1972 (cumulative)	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	—	—	—	8	32	30
Other agency	18	9	23	47	—	—
Total	18	9	23	55	32	30

Table 4.9 shows growth of pump sets energised during the period 1971-72 to 1976-77 according to the sources of finance. It may be noticed that the number of pump sets financed under REC scheme is growing consistently as compared to that of the other agencies.

TABLE 4.9 PUMP SETS ENERGISED IN BASTAR, 1971-72 TO 1976-77

Source of financing	Energised during					
	1972 (cumulative)	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	—	—	—	9	16	25
Other agency	248	137	58	37	80	95
Total	248	137	58	46	96	120

The growth rate of small industries electrified by REC and other agencies during the same period unfortunately is very poor (Table 4.10). It is interesting to note that in the period 1975-76, there is an appreciable rise in the number of small-scale industries financed by agencies other than the REC.

TABLE 4.10 GROWTH OF SMALL-SCALE INDUSTRIES ELECTRIFIED DURING 1971-76 BY DIFFERENT SOURCES OF FINANCING IN BASTAR

<i>Source of financing</i>	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	—	—	—	—	2	2
Other agency	47	20	5	4	28	—
Total	47	20	5	4	30	2

TARGETS AND ACHIEVEMENTS

As on March 1978 there was a target of electrifying 105 villages. Out of that only 11 could be electrified (Table 4.11) which is only 10.5 per cent of the total target. The achievement is 6.8 per cent in case of agricultural pump sets, 38.9 in domestic/commercial service connection, 25.1 per cent in H.T. lines, 24.6 in L.T. lines and 12.0 in case of distribution trans-

TABL 4.11 TARGETS AND ACHIEVEMENTS OF RURAL ELECTRIFICATION IN BASTAR AS ON 30.9.78

<i>Item</i>	<i>Target</i>	<i>Achievement</i>
(1)	(2)	(3)
New villages electrified (no.)	105	11
H.T. lines (km.)	553	138.75
L.T. lines (km.)	2,395	58.889
Distribution transformer (KVA) (100/60/33)	108	13
Pump sets	132	9
L.T./agro industries (no.)	8	—
Dom./comm. services (no.)	1,100	428
Street light points (no.)	410	—
Others	—	—

formers. On the other hand, no progress has been made towards the targets set for L.T. industries and street lighting. The progress made schemewise is shown in Appendix 4.2.

RURAL ELECTRIFICATION SCHEMES

In pursuance of the directives issued by the Government of India, REC has developed a number of loan schemes specially tailored to meet the needs of backward areas. There are loans meant for ordinary backward (OB) areas; specially underdeveloped (SU) areas covering hilly, desert and tribal areas and areas identified by the Planning Commission for the MNP, (now called as RMNP) health centres (MH), growth centres (MG), rural industries (MI), harijain bastis (HB) and so on. In the context of Bastar district which is covered by the MNP, the scheme of REC under MNP* is very important. In fact there are MNP ordinary and MNP hilly, tribal and desert areas schemes, the latter being applicable in case of Bastar.

For certain backward areas where transmission lines have not reached (particularly in tribal, hilly and desert areas) REC provides loans for their extension. The scheme for transmission lines (ST) was sanctioned in 1975 in case of Bastar also (Appendix 4.3). To reduce transmission losses, the REC has developed a System Improvement Loan (SS). In February 1978, two new categories of schemes—Special Project Agriculture (SPA) and Special Project Industries (SPI) have been introduced by the REC to meet the growing demand for energisation of irrigation pump sets and industrial units in potential rural areas. The following Table indicates details of the terms and conditions of the main categories of REC's loan†.

	OA	OB	SU	MNP
(i) Period of repayment of loan (years)	20	25	30	30
(ii) Moratorium (years)	5	5	5	5
(iii) Range of rate of interest for 5 years slabs	7½—9½	7—9½	6½—9½	6—7½
(iv) Viability criteria of 3½ per cent net return to be achieved (year)	15th	20th	25th	25th

As stated in the beginning of this chapter, the level of electrification in the district is very poor as compared to the State. Also there are variations

*For purpose of MNP, State Governments in consultation with the Planning Commission notified 171 districts in 16 States falling under this programme.

†L.K., Sen, "The Role of Rural Electrification Corporation in the Development of Backward Areas", *The Indian Journal of Public Administration*, (Special Number) Development of Backward Areas, Vol. XXIII, No. 3, 1977, pp. 575-77.

within the district in this regard. An attempt has, therefore, been made below to analyse this variation among tehsils. The tehsilwise percentage of electrification is given in Table 4.12 whereas blockwise details are shown in Appendix 4.4.

TABLE 4.12 TEHSILWISE PERCENTAGE OF VILLAGES ELECTRIFIED TO TOTAL INHABITED VILLAGES IN BASTAR

<i>Name of tehsil</i>	<i>Inhabited villages</i>	<i>Villages electrified</i>	<i>Per cent of villages electrified</i>
(1)	(2)	(3)	(4)
Jagdalpur	570	90	15.79
Dantewada	233	17	7.30
Konta	317	12	3.79
Bijapur	518	1	0.02
Kondagaon	531	14	2.64
Narayanpur	626	7	1.12
Kanker	318	51	16.04
Bhanupratappur	252	10	3.97
District	3,365	202	6.00

An attempt has been made in the following section to analyse various REC schemes sanctioned for the district (Appendix 4.3). A synoptic view of these schemes may be had from Appendix 4.5.

Jagdalpur, Lohandiguda, Bastar, Bakawand and Tokapal Blocks in Jagdalpur Tehsil, S.U. Scheme

The details of this schemes are as under:

<i>Date of sanction</i>	..	30.6.1973
Villages proposed to be electrified	..	115
Cost of scheme	..	53.84 lakh
Proposed number of pump sets	..	750
Proposed number of L.T. Industries	..	120
Number of light and fan consumers	..	2,800
Number of street light	..	900

Out of a total of 115 villages to be electrified under REC schemes only 52 could be electrified (Appendix 4.2) by March 1978. A total of 46 pump-sets, 2 LT/Agro Industries, 669 domestic/commercial units and 136 street lighting points have also been given connections during this period. Total route km of H.T. and L.T. lines covered so far is 125 and 103, respectively.

Konta and Dantewada Tehsils, SU Scheme

The details of this REC scheme are as follows:

<i>Date of sanction</i>	..	28.2.1974
Villages to be electrified	..	39
Cost of Scheme	..	27.55 lakh
Pump sets	..	450
L.T. industries	..	40
Light and fan	..	400
Street light	..	200

SU=Specially under developed.

Of the total of 39 villages, 30 have already been electrified. Besides, connections for 24 pump sets, 4 L.T. industries, 726 domestic/commercial services and 390 street lighting were provided by March, 1978. A total of 116 km of H.T. lines and 94 km of L.T. lines has also been laid under the scheme.

Bijapur, Bhairamgarh, Bhopalpatnam and Usoor Blocks, MNP Scheme

The details of this scheme are as under:

<i>Date of sanction</i>	..	25.1.1975
Villages to be electrified	..	120
Pump sets	..	400
L.T. industries	..	30
Light and fan	..	500
Street light	..	100

Till March 1978, only 8 villages could be electrified due to a very late release of the first instalment of loan from the REC. As a result, one L.T. industry, 451 domestic/commercial services, 146 street light connections could come up so far. A total length of 161 km of H.T. lines and 16 km of L.T. lines have also been laid in the four blocks.

Bastar and Bakawand Blocks in Jagdalpur Tehsil

The details of this MNP scheme, are as follows:

<i>Date of sanction</i>	..	30.7.1977
Villages to be electrified	..	20
Cost of scheme	..	17.621 lakh
Pump sets	..	100
L.T. industries	..	4
Light and fan	..	230
Street lights	..	140

The scheme is progressing well. Till March 1978, 23 pumpsets, 37 domestic/commercial and 15 street lights have been given connections. The length of H.T. and L.T. lines is 10 and 113 km respectively.

Narayanpur and Bhanupratappur Blocks

The details of this MNP scheme are furnished below:

<i>Date of sanction</i>	..	30.7.1977
Villages to be electrified	..	15
Cost of scheme	..	10.34 lakh
Pump sets	..	70
L.T. industries	..	3
Light and fan	..	200
Street light	..	110

This scheme has been started only recently. So far, one village, 62 pump sets, one L.T. industry and 129 domestic/commercial units have been provided with connection. The total length of H.T. and L.T. lines covered is 9 and 63 km, respectively.

Apart from the above mentioned schemes, there are three MNP schemes which have been sanctioned recently. These are the following:

Konta Tehsil, MNP Scheme

The details of scheme are as under:

<i>Date of sanction</i>	..	28.9.1977
Villages to be electrified	..	19
Cost of scheme	..	17.595 lakh
Pump sets	..	36
L.T. industries	..	2
Light and fan	..	80
Street light	..	100

Narayanpur and Orcha Blocks

The details of this scheme are as follows:

<i>Date of sanction</i>	..	2.12.1977
Villages to be electrified	..	12
Cost of scheme	..	20.549 lakh
Pump sets	..	25
L.T. industries	..	2
Light and fan	..	50
Street light	..	50

Kondagaon, Makdi, Baderajpur, Keshkal and Pharasgaon, MNP scheme

The details of the scheme are furnished below:

<i>Date of sanction</i>	..	7.12.1977
Villages to be electrified	..	88
Cost of scheme	..	67.09 lakh
Pump sets	..	300
L.T. industries	..	25
Light and fan	..	500
Street light	..	400

It is not possible to assess their progress made in these schemes so far. Since the participation in electricity programmes in tribal areas was poor and the anticipated returns could not satisfy the norms laid down by the MPEB, the Tribal Welfare Department decided to subsidise schemes in tribal areas during the year 1971-72. Lump-sum grants were placed with MPEB during this year and later five schemes were sanctioned for the next year period. Of these, one scheme was for Jagdalpur and others for Kondagaon Project Area.

CHANDRAPUR

Electricity can play a vital role in developing the agricultural and industrial potential of Chandrapur district. The percentage of villages electrified in the district is 19.8 as against the Maharashtra's figure of 58.33 per cent in 1976-77. The per capita consumption of electricity in the district is 10.2 KWH as compared to the State figure of 55 KWH. The percentage of agricultural pump sets energised in the district to the total

pumpsets energised in the State is only 0.27. This shows the underdeveloped nature of electricity facilities in the district.

The first place to receive electricity in the district was Ballarshah town in October, 1957. Chandrapur town was electrified in 1958. The rural electrification work, in fact, was started in the year 1965 when Bhadrawati block headquarter in Warora tehsil was electrified. By August 1978 there was no block in the district where none of the settlements were unelectrified. The last block to be electrified was Yetapalli in Sironcha tehsil.

POWER GENERATION

Chandrapur is supplied electricity from the VKM (Vidharba, Khandesh and Maharashtra) grid. The only thermal power station in the district is located at Ballarshah; others are located outside the district. These are: (i) Khaper Kheda (90 MW) thermal station in Nagpur district; (ii) Paras (92.5 MW) thermal power station in Akola district; (iii) Bhusawal (62.5 MW) thermal power station in Jalgaon district; (iv) Nasik thermal power station (200 MW) in Nasik district, (v) Parli thermal power station (60 MW) in Parli district, and (vi) Koradi thermal power station (360 MW) in Nagpur district. All the above mentioned thermal stations are connected with the VKM grid. This grid also connects one hydro-power station at Yeldari. During the proposed period of the study, another power generating station is expected to come up at Durgapur near Chandrapur by March 1981. Whereas the capacity of Ballarshah is 22.5 MW, the capacity of (Durgapur) Chandrapur is proposed to be 2,000 MW.

Not only is the generating capacity of the district low, the distribution network is extremely rudimentary. There are only two power sub-stations of 220 KV, five of 66 KV and six sub-stations of 33 KV in the district. Sub-stations of 220 KV are located at Warora and Chandrapur; 66 KV sub-stations are located at Warora, Chandrapur, Allapalli, Sironcha and Bhandak; and sub-stations of 33 KV are located at Mul, Nagbhid, Brahmapuri, Warora, Sindewahi and Chimur. It is also proposed to establish a 33/11 KV sub-station at Rajura.

Table 4.13 shows the progress of transmission and distribution lines over the years in Chandrapur district. The rate of growth of the extension of 11 KV line has been very high during 1974-75 when a total length of 227.24 km was laid. The increase has gone down thereafter. On the other hand, the construction of L.T. lines shows an increasing trend till 1973-74 but declines afterwards. The pattern of growth in the various components of L.T. lines follows that of total L.T. lines.

The distribution of electrified villages in different population size categories is shown in Table 4.14. It may be noted that like Bastar, in Chandrapur district also there is a bias in favour of the larger settlements. A few villages in the size group of less than 200 persons are electrified and

TABLE 4.13 PROGRESS OF TRANSMISSION AND DISTRIBUTION LINES
IN ROUTE KM IN CHANDRAPUR

<i>Particulars</i>	<i>Progress during</i>						<i>Total at the end of 1976-77</i>
	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>11 KV line</i>	78.30	70.11	163.77	227.24	161.59	59.60	760.61
<i>L.T. line</i>	85.10	114.90	173.13	125.33	77.99	68.24	644.74
<i>1 Q 3 wire</i>	53.50	80.50	100.13	75.00	47.00	34.29	300.42
<i>3 Q 4 wire</i>	18.50	20.10	53.00	35.00	20.00	24.00	146.60
<i>3 Q 5 wire</i>	13.10	14.30	20.00	15.33	10.99	10.00	83.72

SOURCE: MSEB, O & M Division, Chandrapur.

TABLE 4.14: DISTRIBUTION OF ELECTRIFIED VILLAGES IN DIFFERENT
POPULATION SIZE CATEGORIES IN CHANDRAPUR

<i>Population size</i>	<i>Number of electrified villages</i>	<i>Per cent of electrified villages</i>
(1)	(2)	(3)
Less than 200	35	3.31
200—499	74	8.86
500—999	207	34.79
1,000—1999	167	64.23
2,000 and more	84	90.32

their percentage to the total villages is much less compared to other categories.

Tehsilwise growth of number of villages electrified is shown in Table 4.15. The progress of village electrification was high during 1973-74 like that of the transmission and distribution lines. At either side of this period the progress is slow. The annual rate of growth of village electrification during the period from 1971-72 to 1976-77 is of the order of 7.16 per cent. Table 4.15 shows the growth of agricultural pump sets during this period for the tehsils. As may be seen, the growth rates varies over the years both for pump sets and villages electrified. The blockwise growth in the number of villages electrified in Chandrapur is shown in Appendices 4.7 and 4.8. Fig 4.2 shows the network of transmission and distribution channels.

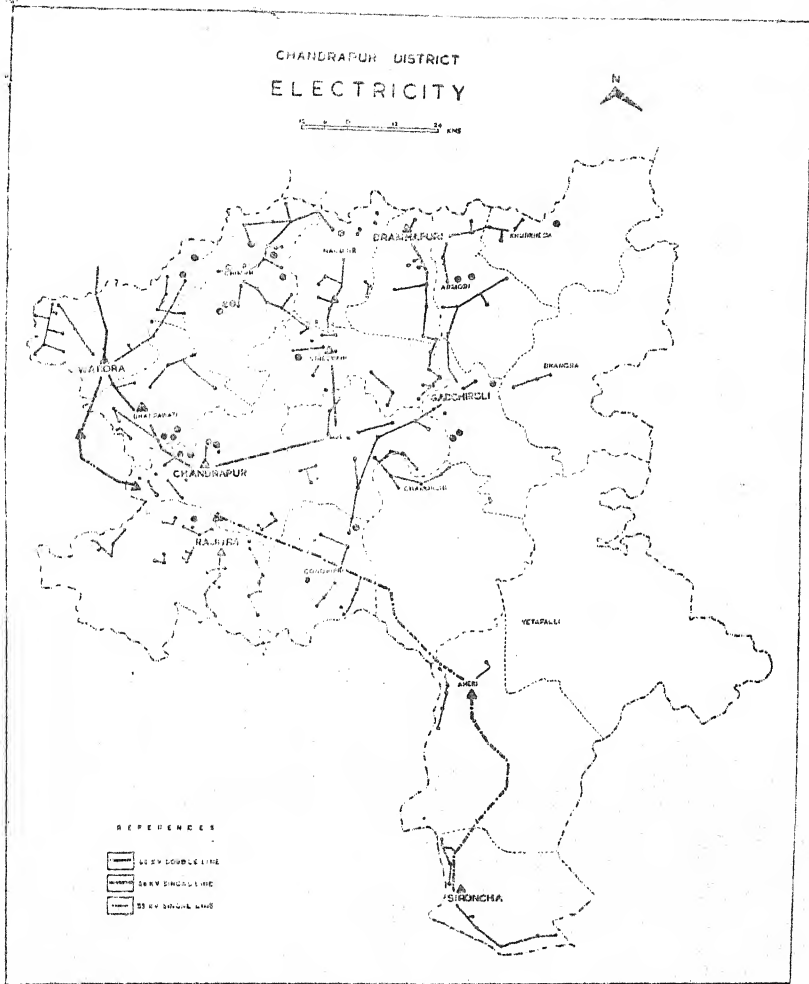


FIG. 4.2

Appendix 4.9 gives the percentage distribution of electrified villages in different blocks of Chandrapur. It may be seen that the spatial disparity is significant ranging from 1.16 per cent in Dhanora block to 54.21 per cent in Brahmapuri block.

GROWTH IN CONSUMPTION OR SALES OF ELECTRICITY

The sale of electricity has increased steadily over the year in the case of domestic and industrial connections. For commercial, agricultural, street lighting, etc., there is a fluctuating trend during 1972-73 to 1976-77 (Table 4.16).

TABLE 4.15 TEHSILWISE GROWTH OF NUMBER OF VILLAGES AND AGRICULTURAL PUMP SETS IN CHANDRAPUR

Name of tehsil	1971-72		1972-73		1973-74		1974-75		1975-76		1976-77		
	V	P	V	P	V	P	V	P	V	P	V	P	P
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(13)
Chandrapur	10	36	7	105	12	81	12	96	6	81	2	88	88
Warora	5	53	4	150	10	89	11	53	9	43	6	117	117
Brahmapuri	16	25	8	96	23	130	22	126	3	94	1	132	132
Gadchiroli	16	8	6	24	10	12	8	29	2	18	2	32	32
Sironcha	5	14	4	50	3	23	7	42	1	22	3	41	41
Rajura	3	12	14	39	7	56	9	60	1	32	8	16	16
Total during the year	55	148	43	464	65	391	69	406	22	290	22	416	416
Total at the end of the year	346	938	389	1,402	454	1,793	523	2,199	545	2,489	567	2,905	2,905

SOURCE: MSEB, O & M Division, Chandrapur

V=Village;

P=Agricultural pump sets

TABLE 4.16 SALE OF ELECTRICITY IN CHANDRAPUR

(Rs. in '000)					
Particulars	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(5)
Domestic	3,860	3,919	4,825	5,193	6,367
Commercial	3,030	2,909	3,215	3,153	3,508
Agricultural	247	911	1,452	1,270	2,083
Industries	5,089	5,632	6,299	7,342	8,474
Street lights	1,091	1,123	1,212	1,192	1,498
Others	247	328	388	513	531

SOURCE: MSEB, O & M Division, Chandrapur.

Table 4.17 shows the growth of per capita consumption of electricity in rural areas. But for a marginal fall in 1973-74 the trend in the consumption shows an increase particularly in 1976-77 when it jumps from 4.5 KWH to 10.2 KWH.

TABLE 4.17 GROWTH OF PER CAPITA CONSUMPTION IN RURAL AREAS IN CHANDRAPUR

Year	Electricity consumption in rural areas (KWH)	Per capita consumption (KWH)
(1)	(2)	(3)
1972-73	6,02,14,867	3.95
1973-74	5,58,85,480	3.56
1974-75	6,05,30,300	3.60
1975-76	6,98,34,084	4.15
1976-77	15,61,18,200	9.17

NOTE: Population figures have been projected based on past trend and the family planning drive in the district.

SOURCE OF FINANCE

It is seen in Table 4.18 that REC financed schemes have led to a sustained growth of the number of electrified villages in the district. The performance of the other schemes, however, is not equally consistent.

The REC schemes show fluctuating growth over the period 1971-72 to 1976-77 in respect of energising agricultural pump sets. The same pattern can be seen in the case of schemes under State Plan (Table 4.19).

TABLE 4.18 GROWTH OF ELECTRIFIED VILLAGES BY DIFFERENT SOURCES OF FINANCING IN CHANDRAPUR

Source	As on March 1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	82	103	138	178	185	185
State Plan	276	25	—	—	—	385

TABLE 4.19 GROWTH OF PUMP SETS ENERGISED DURING 1971-72 TO 1976-77 BY DIFFERENT SOURCES OF FINANCING IN CHANDRAPUR

Source	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC: At the end of the year	82	217	299	265	483	521
During the year	—	135	82	66	118	38
State Plan: At the end of the year	854	1,285	1,559	1,772	1,994	2,346
During the year	—	431	264	213	222	352

Under State Plan financed schemes the number of small scale industries rises consistently reaching a peak in the year 1974-75 when 322 small scale industries were electrified during that year (Table 4.20). After that the increase has been modest for two subsequent years. Similar was the pattern of growth in the case of REC financed schemes. Here again, the progress during the year 1974-75 has been impressive as 63 small scale industries were given connection which is the highest number so far.

Domestic and commercial services electrified under REC financed schemes were of the order of 2,568 in 1976-77 whereas under the State Plan 32,483 services were electrified (Table 4.21).

The total loan sanctioned through agencies during 1971-76 is shown in Table 4.22. During the period 1971-76 the loan sanctioned by the REC is not quite impressive; the loans under the State Plan being substantially higher. However, a temporal comparison with REC schemes is not possible due to non-availability of data from 1971 to 1973 for the State Plan schemes. Appendix 4.10 gives a detailed account of budget provision and

TABLE 4.20 GROWTH OF SMALL SCALE INDUSTRIES ELECTRIFIED DURING 1971-76 BY DIFFERENT SOURCES OF FINANCING IN CHANDRAPUR

Source	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC: At the end of the year	—	41	51	63	16	10
During the year	28	69	110	173	189	199
State Plan: At the end of the year	—	90	73	322	114	141
During the year	690	780	853	1,175	1,289	1,430

TABLE 4.21 GROWTH OF TOTAL SERVICES: DOMESTIC AND COMMERCIAL IN CHANDRAPUR, 1971-76

Source	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	—	—	—	—	—	2,568
State Plan	—	—	23,439	27,311	29,883	32,483

TABLE 4.22 LOAN ADVANCED DURING 1971-76 BY DIFFERENT AGENCIES IN CHANDRAPUR DISTRICT

(Rs. in lakhs)						
Source	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)
REC	43.156	3.486	16.675	2.44	—	48.06
State Plan	—	—	—	24.00	21.00	65.00

SOURCE: MSEB, O & M Division, Chandrapur.

expenditure for 1975 and two subsequent years under tribal and non-tribal sectors.

TARGETS AND ACHIEVEMENTS

A comparison between targets and achievements for different types of services presents a very interesting picture. As on December, 1977, of the total target of 400 pump-sets 378 were energised. In case of industrial connections the target was 150 units, of which 153 actually materialised. The target for domestic and commercial connections was 2,500, of which 2,442 connections were given; whereas in case of street-lighting, of the total target of 15 point only 11 were connected (Table 4.23).

TABLE 4.23 TARGET AND ACHIEVEMENT FOR DIFFERENT TYPE OF SERVICES IN CHANDRAPUR

<i>District</i>	<i>Pump set</i>		<i>Industries</i>		<i>Dom./Com.</i>		<i>Street light</i>	
	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Chandrapur	400	378	150	153	2,500	2,442	15	11
	nos.	nos.	nos.	nos.	nos.	nos.	nos.	nos.

A synoptic picture of the achievements of rural electrification programme till 31st December, 1977 is presented in Table 4.24.

TABLE 4.24 TARGET AND ACHIEVEMENT OF RURAL ELECTRIFICATION IN CHANDRAPUR AS ON 31-3-1977

<i>Particulars</i>	<i>Achievement</i>
(1)	(2)
No. of villages electrified	570
H.T. lines in km	1,509.39
L.T. lines in km	1,539.59
No. of distribution transformers	661
No. of agricultural pump sets	2,867
No. of L.T. industries	1,629
No. of dom./com. (light & fan)	28,667
No. of street lights	311

SOURCE: E.E., O & M Division, Chandrapur.

RURAL ELECTRIFICATION SCHEMES

Unlike Bastar, Chandrapur does enjoy the advantages of the MNP schemes of REC as the former has not been so declared. So far only OB and SU schemes, discussed earlier have been sanctioned by the REC in this district (Appendix 4.11). The sanctioned REC schemes have been discussed in the following section:

Chanda, Warora, Brahmapuri, Gadchiroli and Rajura Tehsils

This REC scheme of OB category was sanctioned by the REC on the 29th April, 1970. The details of the scheme are as follows:

Villages to be electrified	..	91
Cost of Scheme	..	Rs. 58.07 lakhs
Agricultural pump sets	..	1,300
Domestic/commercial	..	2,000
L.T. industries	..	157
Street lighting	..	900

It can be seen from Appendix 4.12 that of the total of 91 villages of the scheme, 90 have already been electrified. It shows that against the target of 449, 378 pump sets were energised till September, 1978. In case of L.T. industries, with a target of 157, 136 have been given electricity connections. However, the progress made with regards to commercial connections is far from satisfactory. Although the target was for providing 1,363 connections by September, 1978 but 1,536 connections could be given by that time. Still 465 more such connections are anticipated to be covered under this scheme. The progress made in connection with H.T. lines L.T. lines and distribution transformers is, on the other hand, quite satisfactory (Appendix 4.12). The blockwise progress of the number of villages electrified under this scheme is given in Appendix 4.13.

Chanda, Warora, Brahmapuri, Gadchiroli and Rajura Tehsils

This REC scheme was sanctioned on the 29th December, 1971 under OB category of loan. The details of this scheme are as under:

Villages to be electrified	..	108
Cost of scheme	..	Rs. 71,097
Agricultural pump sets	..	1,000
L.T. industries	..	170
Domestic/commercial	..	1,900
Street lighting	..	1,015

Against the target of 108 villages to be electrified by March, 1978, 92 villages have already been electrified. The target for agricultural pump sets was 800, of which only 231 were energised and out of 136, 106 L.T.

industries were given an electricity connection by September, 1978. The progress made in case of other connections and H.T. and L.T. lines is shown in Appendix 4.12. Blockwise number of villages electrified under the scheme are shown in Appendix 4.13 whereas the blockwise growth of number of connections and connected load under different categories is given in Appendix 4.11.

Warora Tehsil

This scheme was sanctioned on the 3rd January, 1977 under OB category of loan by the Rural Electrification Corporation.

Villages to be electrified	..	139
Cost of scheme	..	Rs. 63.436
Agricultural pump sets	..	480
L.T. industries	..	45
Domestic/commercial	..	720
Street lighting	..	701

By September, 1978 that is after two months of the sanction, out of a target of 30 villages, 6 were already electrified. An achievement of similar order has been reported in case of agricultural pump sets and other connections.

Mul-Gondpipri

This is an OB scheme sanctioned on the 31st January, 1977 along with the preceding REC schemes. Its progress is comparable to the one mentioned above. The scheme envisages the following:

Villages to be electrified	..	192
Cost of scheme	..	Rs. 77.560 lakhs
Agricultural pump sets	..	454
L.T. industries	..	81
Domestic/commercial	..	1,762
Street lighting	..	870

Gadchiroli

This SU scheme sanctioned on the 2nd December, 1977, envisages the following:

Villages to be electrified	..	145
Cost of scheme	..	Rs. 70.637 lakhs
Agricultural pump sets	..	410
L.T. industries	..	52
Domestic/commercial	..	815
Street lighting	..	740

Sironcha

This is also a SU scheme sanctioned by the REC on the 7th December, 1977. The details of the scheme are as follows:

Villages to be electrified	..	146
Cost of scheme	..	Rs. 81.189 lakhs
Agricultural pump sets	..	360
L.T. industries	..	38
Domestic/commercial	..	1,690
Street lighting	..	1,110

As the above two schemes, namely, Gadchiroli and Sironcha have been sanctioned recently, it is not possible to discuss their progress.

Apart from REC schemes a large number of villages have been electrified under Normal Development Programmes both in tribal and non-tribal areas. As indicated in Appendix 4.13, a total of 385 villages have been electrified up to March, 1977 under these programmes. Blockwise distribution of these electrified villages is given in the Appendix. However, the number of electrified villages covered under other schemes is very small as compared to other rural electrification schemes. In all only 20 villages have been electrified by March, 1977 under these schemes.

5

Rural Electrification: The Plan for 1983

THE PACE and pattern of economic development in a backward region of India would depend, among other things, on the socio-economic structure of the economy and the developmental strategies. The socio-economic structure determines growth potential of different sectors, viz., agriculture, mining, manufacturing, etc., while the plan—priorities determine the direction of change from the past trend. Thus, in any planning exercise, the *structural constraints* and the *chosen priorities* ultimately determine the achievements. Planning implies making projections into the future with the aim of changing the past trends.

An attempt to work out a perspective plan for a region must analyse the *objectives* and the *structure* although their relative importance would vary depending on the situation. In some of the perspective plans prepared at the regional and sub-regional levels, the plan priorities have been given utmost consideration with some indications of the physical bottlenecks relating to the availability of primary resources. Here it is implicitly assumed that given the political will the required institutional and technological conditions can be achieved.¹ A second approach relies mainly on the past trends in making projections for future, suggesting marginal modifications here and there. In the under developed sub-regions of Bastar and Chandrapur where the process of structural under development is yet to be understood and many of the socio-economic ramifications of the tribal system continue to be a mystery for the social scientists, relatively greater emphasis ought to be given to the study of the structure. Therefore, it is necessary to analyse not only the natural resource situation but also the social, institutional and other constraints of the system before

¹NCAER Report on "Perspective Plan for Rural Electrification in the Telangana Region".

formulating any plan. It is possible to change the semi-closed tribal sub-system only after understanding it in proper perspective.

In the context of rural electrification it is politically convenient to argue that the growth of high income generating sectors like modern agriculture and industry be encouraged in all areas in the region. With limited resources, however, neither these desired levels of infrastructure be created in all the sub-regions nor it is possible to justify uniform spread of resources in space. However, investment in backward regions can be justified in terms of pure economic criteria taking long-term returns into consideration. Besides, there are considerations of social justice as operationalized in the minimum needs and related programmes in the Indian context that would lend support to the strategy of providing basic economic amenities like electricity to the remote rural areas.

The districts of Bastar and Chandrapur are not only underdeveloped but also have weak and dysfunctional transport and communication linkages with other nodes of the country. As such, the considerations governing modernization and electrification of this region are dependent more on the need to develop the region and not on the needs of the national economy. Thus, the plan for this region will largely be independent of the sectoral input-output requirements at the national level.* The district plan, however, must take note of the objectives set at the macro-level. It is proposed in the present study to make projections for electricity demand, its utilization pattern in space as well as over different user categories within the framework of a comprehensive development plan. The end of the Five Year Plan, 1978-83 (initially thought as the Sixth Five Year Plan) has been taken as a target year for projections alongwith the interim time profile wherever possible.

MODELS FOR EXPLANATION AND PROJECTIONS

For making projections for the electrification plan for the two districts, a number of statistical exercises have been carried out. These, at the first stage, help in understanding and explaining the present pattern of development of electrification load temporarily as well as cross sectorally. At the second stage, these have been applied to project the future pattern of connections and load development. We discuss below the statistical exercises which explain the existing situation and also provide the basis for making projections.

*The only product from this region which is available at a supply level, important at the national level is wood, and it should be borne in mind that timber prices have risen tremendously in the preceding few years and hence the output of all major and minor sectors of this region can be absorbed in the national economy without any crisis of demand.

*Computation of Average Connections (pump sets)
and Average Connected Load per Village*

A time profile of the average number of connections and connected load for five successive years has been computed for the villages electrified in different time periods for the two districts separately. The average connected load (pump sets) for an average village electrified during 1968-69 for example, was obtained by dividing the total connected load (pump sets) of the villages electrified during that year by the corresponding number of villages. Here two different sets of estimates have been made. In the first, the villages electrified during that year and having positive load have been included in the denominator while in the second case, all the villages electrified during that year independent of their connected load have been considered. Thus the average load (pump sets) per village would be higher in the first case compared to that of the second. For the four subsequent years (for the villages electrified during 1968-69) the average connected load (pump sets) per village has been obtained by dividing the connected load (pump sets) of these villages by the number of villages (which remains constant overtime). The time profile of average connected load connections for the villages electrified during 1969-70, 1970-71, etc., have been computed in a similar fashion. Tables 5.1 and 5.2 give the results of the two sets of exercises. It may be seen that Tables indicate no definite pattern. It is not possible to say whether the average load during the five successive years after electrification increases with time or not. Similarly we cannot say that load becomes more stable over time.

Attempt has also been made to analyse the development of connections and connected load per village in different blocks in five successive years after electrification (Tables 5.15 and 5.16). Here the actual date of electrification has been considered unimportant. First the connected load and pump sets in villages in the first year of their electrification (irrespective of the year of electrification) were computed for different blocks. For these villages the connected load/pump set in their second, third, fourth and the fifth year was obtained. Dividing the connections/connected load by the number of villages electrified (which remain constant over the years) the profile of average connection and load in successive years has been worked out. Here two sets of results were obtained; the first one using all electrified villages in the denominator, and the second considering villages with positive connected load as electrified thus putting a smaller denominator. Once again it appears that the inter-block variation does not show any pattern to be useful in making projections except the fact that both connected load as well as pump set per village increases overtime. This detailed analysis has been attempted only for Bastar district where the time lag in stabilization of load is significant. For Chandrapur also a primary analysis of this nature was attempted which showed little improvement in connected

TABLE 5.1 DEVELOPMENT OF NUMBER OF CONNECTIONS AND CONNECTED LOAD IN SUCCESSIVE FIVE YEARS
IN AN AVERAGE VILLAGE FROM THE YEAR WHEN ITS CONNECTED LOAD BECAME POSITIVE
IN BASTAR

Years	Ist year		IInd year		IIIrd year		IVth year		Vth year	
	No.	C.L.	No.	C.L.	No.	C.L.	No.	C.L.	No.	C.L.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1968-69	2	8.69	2	9.22	3	10.06	3	13.51	3	13.94
1969-70	6	26.50	7	29.23	10	39.66	10	40.10	10	39.35
1970-71	7	17.38	4	12.58	6	24.32	5	25.44	5	26.77
1971-72	4	12.85	5	16.42	5	17.92	6	19.03	6	19.03
1972-73	4	16.69	4	17.92	4	17.21	4	17.46	4	17.73
1973-74	4	12.00	4	14.50	6	20.30	5	19.10	N.A.	N.A.
1974-75	2	8.58	2	8.67	2	8.00	N.A.	N.A.	N.A.	N.A.
1975-76	3	17.23	3	15.55	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1976-77	2	12.37	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Average	3.78	14.70	3.87	15.51	5.14	19.64	5.5	22.44	5.60	23.36

C.L. = Connected Load (in H.P.)

N.A. = Not available

TABLE 5.2 DEVELOPMENT OF NUMBER OF CONNECTIONS AND CONNECTED LOAD IN SUCCESSIVE FIVE YEARS IN AN AVERAGE VILLAGE FROM THE DATE OF ELECTRIFICATION IN BASTAR

Years	(Connected Load in H.P.)									
	Ist year		IInd year		IIIrd year		IVth year		Vth year	
(1)	No.	C.L.	No.	C.L.	No.	C.L.	No.	C.L.	No.	C.L.
1968-69	2	6.79	2	7.80	2	7.74	3	10.39	3	11.80
1969-70	4	17.67	5	19.59	7	26.44	7	25.73	7	26.23
1970-71	2	11.24	3	14.01	3	17.17	3	15.61	3	16.43
1971-72	3	11.25	4	13.00	4	14.19	5	15.86	5	15.86
1972-73	2	12.06	3	12.94	3	13.39	3	14.56	3	15.52
1973-74	2	6.67	3	9.72	5	17.00	3	10.94	N.A.	N.A.
1974-75	1	6.87	1	6.13	1	7.20	N.A.	N.A.	N.A.	N.A.
1975-76	2	14.94	1	11.41	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1976-77	2	6.18	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Average	2.22	10.41	2.75	11.83	3.57	14.73	4.00	15.68	4.20	17.17

load and pump sets per village over the years subsequent to electrification.

Explanation of the Inter-block Variation in Connected Load

The block level data on various socio-economic attributes have been used in explaining the cross-sectional variation in the connected load for four different usages, *i.e.*, (a) agriculture (pump sets), (b) industries, (c) domestic/commercial, and (d) street-lighting. Most of the indicators used in this model as independent variables are for the year 1976-77 although some of the Census variables were relating to 1971. Use of these Census variables is justified in this model with the assumption that the cross-sectional variation in them in the year 1976-77 would be similar to that of 1971. The explanatory variables used in this model are:

1. Number of connections in agriculture	..	X ₁
2. Number of connections in industries	..	X ₂
3. Number of connections in domestic/commercial	..	X ₃
4. Number of connections in street lighting	..	X ₄
5. Gross area cultivated (hectares)	..	X ₅
6. Net irrigated area (hectares)	..	X ₆
7. Intensity of irrigation	..	X ₇
8. Percentage of area under paddy to gross cropped area	..	X ₈
9. Number of pump sets (diesel and electric)	..	X ₉
10. Number of wells for irrigation	..	X ₁₀
11. Number of tanks for irrigation	..	X ₁₁
12. Per cent of scheduled castes to total population	..	X ₁₂
13. Per cent of scheduled tribes to total population	..	X ₁₃
14. Per cent of secondary worker to population	..	X ₁₄
15. Per cent of tertiary worker to population	..	X ₁₅
16. Production of paddy (quintals)	..	X ₁₆
17. Production of oilseeds (quintals)	..	X ₁₇
18. Number of hospital beds	..	X ₁₈
19. Number of hospitals	..	X ₁₉
20. Percentage of literacy	..	X ₂₀

Four separate stepwise regressions (for four usages) were attempted for each district separately including only the electrified blocks as observations. The regression exercise was terminated as soon as no extra explanation (after adjusting for the degree of freedom) was obtained by including a new variable.

The results of the analysis are given below:

Explaining variations in connected load for agriculture (Ya):

$$\text{BASTAR} \quad Y_a = -13.25 + 4.34 X_1^* + 25.71 X_{19} + .003 X_{17} \\ \bar{R} = .97 \quad F = 47.48^*$$

$$\text{CHANDRAPUR} \quad Y_a = 51.76 + 3.48 X_1^* + .122 X_3 \\ \bar{R} = .978 \quad F = 289.83^*$$

Explaining variations in the connected load for industries (Yi):

$$\text{BASTAR} \quad Y_i = -140.74 + 8.76 X_2^* + 34.74 X_{19}^* - .07 X_{10} \\ 3.6 X_{20} + .25 X_3 \\ \bar{R} = .946 \quad F = 30.66^*$$

$$\text{CHANDRAPUR} \quad Y_i = -105.59 + 11.95 X_2^* + .001 X_{16} \\ \bar{R} = .992 \quad F = 455.4^*$$

Explaining variations in connected load for domestic/commercial purpose (Yd):

$$\text{BASTAR} \quad Y_d = -694.6 + .68 X_3^* + 9.98 X_{19} + 57.1 X_{12}^* \\ -.013 X_{17} + 5.98 X_{13} + 9.7 X_{20} - 2.0 X_1 \\ \bar{R} = .97 \quad F = 41.0^*$$

$$\text{CHANDRAPUR} \quad Y_d = 17.41 + .36 X_3^* \\ \bar{R} = .99 \quad F = 823.7^*$$

Explaining variations in connected load for street lighting (Ys):

$$\text{BASTAR} \quad Y_s = -.07 + .04 X_4^* \\ \bar{R} = .983 \quad F = 524.1^*$$

$$\text{CHANDRAPUR} \quad Y_s = 7.18 + .35 X_2^* + .02 X_4 + .001 X_{17} \\ -.001 X_5 \\ \bar{R} = .972 \quad F = 69.2^*$$

(* marked figures indicate their significance at 1 per cent level)

An Analysis Based on Village Data

A multivariate analysis was attempted taking select electrified villages as units of observation. The dependent variables in this model are: (i) connected load for domestic use, (ii) connected load for agricultural use, (iii) number of connections for domestic use, and (iv) number of connections for agricultural use. There are 23 explanatory variables included in this model. These are:

- | | | |
|------------------------------|----|-------|
| 1. Area (in hectares) | .. | X_1 |
| 2. Number of occupied houses | .. | X_2 |

3. Population	..	X_3
4. Per cent of scheduled castes and scheduled tribes	..	X_4
5. Per cent of literates	..	X_5
6. Dependency ratio per 100 workers	..	X_6
7. Per cent of female participation	..	X_7
8. Per cent of secondary workers	..	X_8
9. Per cent of tertiary workers	..	X_9
10. Per cent of forest land	..	X_{10}
11. Per cent of land under cultivation	..	X_{11}
12. Per cent of irrigated to total cultivated land	..	X_{12}
13. Education .. ..	..	X_{13}
14. Medical .. ..	..	X_{14}
15. Communication .. ..	..	X_{15}
16. Post and telegraph .. ..	..	X_{16}
17. Nearest town and distance ..	..	X_{17}
18. Number of water points: Tanks	..	X_{18}
19. Number of water points: Wells	..	X_{19}
20. Number of water points: Ponds	..	X_{20}
21. Number of Pucca houses ..	..	X_{21}
22. Per cent of production of paddy to total	..	X_{22}
23. Total water points	..	X_{23}

Number of villages selected for Bastar is 44 whereas in the case of Chandrapur the number is 50. The results of the analysis are presented below:

Explaining variations in connected load for agriculture (Ya):

$$\begin{aligned} \text{BASTAR} \quad Y_a &= -25.0 + .46 X_7^* + .06 X_6 + .005 X_3 \\ &\quad + .144 X_{22} \\ \bar{R} &= .47 \quad F = 3.2^* \end{aligned}$$

$$\begin{aligned} \text{CHANDRAPUR} \quad Y_a &= 29.5 + .05 X_{21} - 16.6 X_{15} + .75 X_{27} \\ \bar{R} &= .25 \quad F = 1.7 \end{aligned}$$

Explaining variations in the number of connections for industries (Yan):

$$\begin{aligned} \text{BASTAR} \quad Y_{an} &= -2.35 + .1144 X_7^* + .021 X_6 \\ &\quad - 1.08 X_{15} \\ \bar{R} &= .47 \quad F = 3.8^* \end{aligned}$$

$$\begin{aligned} \text{CHANDRAPUR} \quad Y_{an} &= -3.1 + .006 X_{21} \\ \bar{R} &= .32 \quad F = 1.6 \end{aligned}$$

Explaining variations in connected load for domestic/commercial purpose (Yd):

$$\begin{aligned} \text{BASTAR} \quad Y_d &= .47 + 43.27 X_{14}^* - 0.02 X_1 - 19.9 X_{18}^* \\ &\quad + .75 X_{21} + .01 X_3 \\ \bar{R} &= .80 \quad F = 35.6^* \end{aligned}$$

$$\begin{aligned} \text{CHANDRAPUR} \quad Y_d &= -16.4 + .014 X_3^* + .966 X_9^* \\ \bar{R} &= .77 \quad F = 35.6^* \end{aligned}$$

Explaining variations in the number of connections for street lighting (Ydn):

$$\begin{aligned} \text{BASTAR} \quad Y_{dn} &= -23.3 + 42.08 X_{14} + 1.7 X_5 + 3.4 X_{12}^* \\ &\quad + 18.2 X_{16} \\ \bar{R} &= .83 \quad F = 24.5^* \end{aligned}$$

$$\begin{aligned} \text{CHANDRAPUR} \quad Y_{dn} &= -28.5 + .03 X_3^* + 1.6 X_9 \\ \bar{R} &= .78 \quad F = 36.6 \end{aligned}$$

\bar{R} gives the multiple correlation coefficient adjusted for the degrees of freedom while * marked figures indicate significance at 1 per cent level. It needs to be mentioned that none of the dependent variables in any of the two sets of regression analysis has been considered as an explanatory variable at any step. This is true for first set of regression analysis as well.

A SEARCH FOR AN OPTIMAL SPATIAL PATTERN AS A BASE FOR RURAL ELECTRIFICATION

To determine the spatial pattern of rural electrification in conformity with optimum resource allocation, it is necessary to estimate the developmental potentials of various spatial units. In the present study, villages in general have been taken as the basic units although in some cases it has not been possible to go below the blocks because of the data constraints. In the first stage an attempt has been made to work out a composite level of existing developmental potential using the block level indicators. The indicators chosen for the purpose are: (i) number of growth foci per 1,000 settlement, (ii) density of target settlements, and (iii) ground water potential per village.

It may be seen that although indicators are obtained at the district level, they give an indication of potentiality of development for an average village within the block. The three indicators, however, need further clarification.

In order to find out the growth foci of different orders, villages above 1,000 together and the block headquarters were initially selected, i.e., 353 for Bastar and 371 for Chandrapur. The indicators chosen to reflect the

centrality and growth potentiality of settlements were the following:

1. Educational facilities
 - (a) Existence of primary school
 - (b) Existence of middle school
 - (c) Existence of secondary school
 - (d) Existence of college
2. Health facilities
 - (a) Existence of hospital
 - (b) Existence of maternity and child welfare
 - (c) Existence of health centre
 - (d) Existence of dispensary
 - (e) Existence of family planning centre
3. Transport facilities
 - (a) Existence of bus stop
 - (b) Existence of railway station
 - (c) Existence of pucca road
 - (d) Existence of kuchcha road
4. Communication facilities
 - (a) Existence of post office
 - (b) Existence of telegraph office
 - (c) Existence of post and telegraph office
 - (d) Existence of telephone connection
5. Extension services
 - (a) Existence of seed distribution centre
 - (b) Existence of fertilizer distribution centre
 - (c) Existence of pesticides distribution centre
 - (d) Existence of agricultural implement centre
 - (e) Existence of animal husbandry centre
6. Marketing facilities
 - (a) Existence of weekly market
 - (b) Existence of wholesale, regulated market
7. Electrification
 - (a) Existence of electricity connection

All these indicators are in the form of attributes which take two values, unity in case of the facility existing in the village and zero otherwise. In view of the fact that different indicators have varying degree of importance

in promoting development, it has been considered necessary to give them weightages for aggregation. The principle of scarcity loading has been considered relevant in this context. The method gives higher weightage to the scarce factors and lower weights to the ubiquitous ones. For an i th facility the weight has been computed as $w_i = N/v_i$ or $N/\sum S_{ji}$ where N is the total number of villages under consideration and v_i is the number of villages having i th facility and S_{ji} is unity in case the j th villages have the i th facility and is zero otherwise. The scores for these facilities have not been multiplied by the corresponding weights. These, when aggregated, give the composite score of centrality for each village. For j th village the composite score may be shown to be:

$$C_{ij} = \sum S_{ji} w_i$$

On the basis of the composite scores of centrality, central places of three different categories have been identified, the remaining villages (of those selected in the first round) being termed as Basic Villages. The cut-off point for determining the upper and lower limits for different categories have been worked out on the basis of discontinuities in the series. The standard statistical methods like using mean and standard deviation for working out the limits for different categories or dividing the total range into four equal intervals etc. have not been considered appropriate for this exercise as these methods may put a group of villages with similar characteristics in two different categories. The method of determining the cut-off points based on the observed discontinuities in the series has the advantage that the limits for different categories coincide with the break points which ensures heterogeneity between groups and homogeneity within groups. The break points for the two districts have thus been worked out differently which seem appropriate considering the disparity and diversity in their levels of development. The settlements of first category have been further classified into three groups *viz.*, Growth Centres, Growth Points and Market Centres. The difference between these three groups are not in terms of their centrality scores but is on the basis of certain other characteristics, generally accepted in the growth centre studies.*

The settlements belonging to the second and third categories have been termed as Service Centres and Central Villages respectively. In all 114 villages fall in these three categories is Bastar district. Similarly in Chan-

*A Growth Centre will be an innovative and propulsive centre with a strong manufacturing base. In other words it will be marked by a preponderance of secondary activities. Next in order of importance will be tertiary activities intermixed with a strong agro-industrial sector, whose nature will depend the economic structure of the region which it serves. A Growth Point will be predominantly agro-industrial whereas a Market Centre will be the wholesale collection and distribution centre for the area with a regulated market.

Chandrapur the number of Growth Centres is 123, while 248 villages do not qualify to become a central place as their composite centrality score was very low.*

The second indicator used in measuring the development potential is the density of target settlements, the latter being defined as villages with more than 200 population. Higher density of villages (per sq km) in a block to be electrified is certainly of economic significance in the context of rural electrification as the cost of providing connection per village becomes less and transmission lines become more economic.

The third indicator is the groundwater potential for villages. Irrigation being the major factor behind rural electrification schemes, the availability of groundwater potential is an essential consideration. The total groundwater potential for the blocks of Chandrapur district is available from official sources while in case of Bastar an estimate for the same has been made as per the method discussed in Chapter II. Since for rural electrification villages must be considered as the basic unit, the groundwater potential for an average village has been worked out dividing the groundwater potential by the number of villages in a block assuming uniformity in the distribution of villages in space.

The three indicators have been made scale free by transforming the values of the indicators to a mean of unity. This is necessary to avoid arbitrariness in the choice of initial scale of measurement. The scale free values have been summed up for each block. These composite indices of development potential can now be used as basis for determining the spatial pattern of rural electrification. This index has been viewed as a measure of electrification potential per settlement in each block.

RURAL ELECTRIFICATION—A FUTURE PERSPECTIVE

For projecting the programme of rural electrification for Bastar and Chandrapur districts as a whole, the objectives as enunciated in the plan 1978-83 have been considered. The draft of the Five Year Plan envisages electrification of about one lakh villages covering at the sametime a minimum of 50 per cent villages in every State and Union Territory under the Revised Minimum Needs Programme. Under the programme it is proposed to cover 40,000 villages. The simple rate of growth (annual) of the number of villages electrified during this plan period thus works out to be 9.42 per cent. Although the rate of growth during the sixties have been considerably lower, the average being seven only, the rate 9.4 per cent appears realistic in view of the emphasis laid on the rural development in

*It must, however, be mentioned that some marginal adjustments have been made in case of the settlements with accepted development potential, etc.

the plan. It may be seen that during the fifties and sixties the progress of rural electrification has been quite higher, the rate suddenly coming down and more or less stabilizing in the seventies. This evidently is due to massive electrification programme in some of the northern and southern states where full electrification has been achieved by now and the backward states not showing any indication of such effort. The rate of growth of Bastar recently has been higher than the national average which can be attributed to its low base. The same is true for Chandrapur although the rate is not as high as that of Bastar. It is evident that under the rural electrification schemes the major thrust in immediate future would be on the backward regions. One would, therefore, expect a higher rate of rural electrification for the districts of Bastar and Chandrapur as compared to the rate visualized for the nation as a whole. Nevertheless it is evident that the target of electrifying 50 percent of the villages by 1982-83 (in each State) cannot be achieved for the backward sub-regions like Bastar as the costs may turn out to be astronomical.

An attempt to electrify 50 percent villages in Bastar would imply covering 1,500 villages within a short period of 5 years. On the basis of the estimated figure of 223 as the number of villages electrified by 1978, the (simple) annual rate of growth of villages electrified for our study period works out as more than 100 per cent per annum. This is virtually impossible in view of the resource constraints and the physiographic structure of the district. The investment required to connect these villages in Bastar district alone would be more than 12 crores which is not likely to be made available.

Projecting the rate of growth of rural electrification based on the past performance would be erring on the other side as the rate of growth has been far too inadequate. Even when the growth rate of two years, *i.e.*, 1976-77 and 1977-78 are considered which gives a higher rate of growth than in the past, the additional number of villages to be electrified by 1983 comes out only 230. This may be considered as fairly reasonable looking at the past data but certainly is not adequate in view of the needs of the subsistence economy and its high development potential. It must also be noted that this rate of growth would not even electrify 15 per cent of the villages by 1983. It may, therefore, be proposed that while the target of 50 per cent is too high for the district, projections on the basis of past trends would not answer the need for development planning in the two districts.

However, there is room for optimism even when looking at the past data. An examination of the number of projects sanctioned by the REC during the past four years suggests that there is a definite improvement in the attitude of the planners both at the central as well as state levels with regards to the rural electrification in the district of Bastar. The number of villages to be covered under the REC schemes sanctioned during the calen-

dar year 1977 is 154 which is by all standards quite impressive. It may be erroneous to expect the addition to the number of villages electrified, during the study period to increase in an exponential fashion with 154 as a base. A more realistic projection can be made if the base is identified after ironing out the effect of short time factors and then fitting an exponential trend.

The data for the past five years have been clubbed into two groups (time blocks) on the basis of exogenous information to smoothen out yearly fluctuations. In the first group we have the calendar years 1973 and 1974 while in the second we put 1975, 1976 and 1977. Basing on the two block averages (of the number of villages electrified) we take $Y_t = Y_0 e^{rt}$ as the trend line (because of the nature of the data as discussed above, fitting of the line through regression has not been possible) and work out the annual rate of growth r as .1669. Taking this as the projected rate of growth (to be valid for the period of study) and the number of villages electrified upto 1977-78 as the base year figure, the time profile of the number of villages to be electrified during the period from 1978 to 1983 have been estimated. The following two Tables 5.3 and 5.4 give the time profile of the past and future development.

TABLE 5.3 NUMBER OF VILLAGES ELECTRIFIED IN BASTAR

<i>Upto</i>		<i>During</i>				
1972-73	1973-74	1974-75	1975-76	1976-77	1977-78 (estimated)	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
135	4	14	31	18	22	224

TABLE 5.4 NUMBER OF VILLAGES TO BE ELECTRIFIED IN BASTAR

1978-79	1979-80	1980-81	1981-82	1982-83	Total villages electrified (cumulative)
(1)	(2)	(3)	(4)	(5)	(6)
108	127	150	178	209	996

The total number of villages to be electrified during the period of five years works out to be 772 which appears to be feasible given the develop-

ment potential of the district. In case a concerted attempt is made to break the shackles of the traditional tribal economy and attempt is made to implement the perspective plan in a sectorally integrated manner, it should be possible to achieve this target.

The case of Chandrapur is certainly better than that of Bastar. However, the level of rural electrification in this district is very much lower than the State figure. The percentage of villages electrified in the district is barely 20 per cent as compared to the State average of 60 per cent. Besides, there is a significant inter-block variation in electrification levels ranging from 1.16 per cent in Amroli to 48 per cent in Nagbhid. Among the districts of Maharashtra, Chandrapur comes at the lowest rung in terms of levels of economic development and it would be necessary to provide the basic economic infrastructure including electricity in the district in case due weightage is given to the policy of developing the backward regions. It would, therefore, not be unrealistic to set a target of 50 per cent of the villages being electrified in the district—a target considered to be minimum for all the states of India under the RMN Programme.

Electrifying 50 per cent of the villages by the end of 1982-83 would require connecting an additional number of 793 villages which give an annual simple rate of growth of 29.3 per cent. The rate is higher than what has been experienced in the past—specially the recent past. (It needs to be mentioned that the rate of growth has slowed down considerably and during 1976-77, the figures for Chandrapur and Maharashtra have been 13.0 and 6.3 per cent, respectively). However, considering the backlog of unemployment and under utilisation of resources this target must be considered as feasible. The number of villages with population above 200 target village as per the national pronouncement under the plan 1978-83) is 1,783 in the district of Chandrapur. Even if it is assumed that of all the 793 newly electrified villages none are below 200, about 22.3 per cent of the eligible target villages will remain virgin. This suggests that 50 per cent target for Chandrapur is not very ambitious considering the number of villages.

It is suggested that the connections should be provided in general to the target villages only, *i.e.*, villages above 200 population. And yet, considering the economies of scale involved in electrifying villages in a cluster some villages below 200 population may also get electricity. Hence, priority may be given to target villages in the first phase while the smaller villages in the neighbourhood would eventually come up through demonstration effects. This implies that the actual number of villages electrified would be more than 793.

The present situation of rural electrification in the district has been described in Table 5.5. Here again the figure for the year 1977-78 has been estimated on the basis of the average of the rate of growth of the earlier years. Now using 627 villages as the base year figure and 1,420 as the

TABLE 5.5 NUMBER OF VILLAGES ELECTRIFIED IN CHANDRAPUR

<i>Upto</i>		<i>During</i>				
1972-73	1973-74	1974-75	1975-66	1976-77	1977-78 (estimated)	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
389	65	69	22	24	58	627

terminal year figure of the number of villages electrified and using an exponential growth function, *i.e.*

$$Y_t = Y_0 e^{rt}$$

the rate of growth *r* is estimated as 0.1635 which gives the following time profile of the number of villages electrified in different years (Table 5.6):

TABLE 5.6 NUMBER OF VILLAGES TO BE ELECTRIFIED IN CHANDRAPUR

<i>Upto</i> 1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
627	111	131	155	182	214	1 420

Spatial Distribution of Proposed Villages for Electrification

The total number of villages to be electrified during the perspective plan period being determined for the two districts, the task in hand is that of distributing the villages within the district among different blocks to ensure optimal spatial effectiveness of the electrification programme. As the main objective of rural electrification happens to be stabilizing agriculture through the development of irrigation potential it would be appropriate to determine the share of each block in the total number of villages to be electrified on the basis of index of development potential which has been calculated as per the method discussed above (giving high weightage to irrigation possibilities). Spatial planning would, therefore, be an integral part in designing the electrification schemes. Tables 5.7 and 5.8 show the development potential of the blocks which is the product of the composite index and number of target settlements. The total number to be electrified in the districts has been distributed among the blocks using the developmental potential as the basic proportions.

TABLE 5.7 INDICATORS OF DEVELOPMENT POTENTIAL AND POTENTIAL VILLAGES FOR ELECTRIFICATION IN BASTAR

<i>Name of block</i>	<i>No of Central Places</i>	<i>Index of target settlement</i>	<i>Ground-water potential (wells per village)</i>	<i>Composite index</i>	<i>No. of villages electrified</i>	<i>No. of villages proposed for electrification</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jagdalspur	4	.3400	5.75	4.02	29	45
Bastar	9	.2600	8.72	5.29	26	69
Bakawand	4	.3000	10.12	4.29	9	51
Tokapal	5	.2809	6.76	4.04	12	32
Lohandiguda	3	.1140	10.23	2.83	13	22*
Darbha	2	.1500	13.32	3.16	0	19
Bastanar	2	.1750	23.69	4.60	1	22
Dantewada	8	.1742	20.41	5.88	7	42
Geedam	2	.2033	16.75	3.90	5	32
Kuakonda	3	.1750	22.93	4.79	5	31
Katekalyan	1	.1462	21.21	3.83	—	19
Chhindgarh	4	.3273	17.14	5.33	2	51
Sukma	2	.1531	22.35	4.29	5	28
Konta	3	.0571	4.74	1.69	5	18*
Bijapur	3	.0917	12.05	2.91	1	22*
Bhairamgarh	1	.0662	6.22	1.48	—	9*
Bhopalpatnam	3	.0460	3.66	1.59	—	10*
Usoor	3	.0440	7.07	1.99	—	10*
Bade Rajpur	2	.2304	7.70	2.99	—	21
Kondagaon	4	.1571	5.64	1.81	12	28*
Keshkal	3	.1575	7.57	2.79	2	23*
Makdi	2	.2414	7.27	3.00	—	28
Pharasgaon	2	.2406	5.40	2.77	—	28*
Narayanpur	4	.1803	8.61	3.33	7	31
Antagarh	2	.1707	7.46	2.58	—	24*
Koilibeda	5	.1093	5.41	2.77	—	30*
Abujhmar	2	.0046	—	0.83	—	1*
Kanker	6	.3391	5.94	4.59	26	48
Charama	8	.4550	1.97	5.42	14	67
Sarona	7	.2667	6.53	4.48	11	68
Bhanupratappur	4	.3240	7.99	4.18	7	45
Durgakondal	1	.2200	6.21	2.45	3	22*
District	114	.1555	8.13	43.99	202	664

*Indicates blocks where electrification is to be undertaken at a lower priority than the others.

TABLE 5.8 INDICATORS OF DEVELOPMENT POTENTIAL AND POTENTIAL VILLAGES FOR ELECTRIFICATION IN CHANDRAPUR

<i>Name of block</i>	<i>No. of Central Places</i>	<i>Index of target-settlement</i>	<i>Ground-water potential (wells per village)</i>	<i>Composite index</i>	<i>No. of villages electrified</i>	<i>No. of villages proposed for electrification</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	10	.1233	27.80	2.98	48	13
Mul	11	.1271	24.90	4.39	43	38
Gondpipri	5	.2576	23.24	5.33	37	87
Brahmapuri	7	.1660	9.25	3.75	48	19
Nagbhid	11	.1679	17.85	4.71	58	31
Sindewahi	9	.1657	30.63	4.87	36	51
Sironcha	4	.1714	33.11	4.33	32	16
Aheri	3	.0958	40.91	3.39	12	38
Yetapalli	2	.0560	40.23	2.64	—	42
Gabchiroli	5	.1301	31.08	3.78	20	26
Armori	8	.1481	29.15	4.42	31	15
Dhanora	1	.0723	15.65	1.79	3	25
Chamorshi	10	.1821	37.14	4.19	10	91
Kurkheda	1	.1066	16.38	2.31	13	33
Warora	9	.1588	21.15	4.41	71	57
Chimur	9	.1841	23.60	4.87	34	76
Bhadrawati	7	.1330	28.36	4.02	24	52
Rajura	11	.0956	18.46	3.69	49	76
District	123	.0695	26.12	—	570 (approximately)	793

When the villages proposed for electrification are plotted on map it is observed that in case of Bastar the transmission lines would have to be extended to cover the entire district including the remote blocks of Bijapur tehsil and the Abujhmar block of Narayanpur tehsil. Although this might be desirable in terms of the objectives of balanced regional development, it raises a number of operational questions regarding economic feasibility within a short span of five years. Considering the resource constraints facing the funding agencies, it might be proper to be somewhat conservative in the estimate and exclude some of the remote blocks with low development potential, in the first phase. This is not to suggest that the villages of the second phase should necessarily be eliminated from the Five Year Plan, 1978-83. It is proposed that the second phase may be taken up

only after the completion of the first phase and may be excluded if resource constraints become binding. It is obvious that in terms of cost effectiveness criteria, the blocks of the first phase would be more deserving*.

A fresh list of the villages to be electrified in the phase has thus been prepared by cross checking the initial pattern against spatial effectiveness and development potential criteria.† The villages to be covered under phase II have been shown with asterisk marks in the column showing the proposed number of villages for electrification (Table 5.7). Such bifurcation into different priorities on the basis of spatial remoteness or development potential etc. have not been considered necessary for the district of Chandrapur.

Projecting Electricity Demand for Agriculture—Bastar and Chandrapur

Agriculture is a major component of electricity consumption in rural areas. In agriculture, the only use of electricity in the districts of Bastar and Chandrapur is for energising pump sets for irrigation. The growth of pump sets in the two districts during the seventies has been shown in Table 5.9.

TABLE 5.9 PUMP SETS IN DIFFERENT YEARS IN BASTAR AND CHANDRAPUR

Year	Bastar		Chandrapur	
	Total no. of energised pump sets (cumulative)	Rate of Growth	Total no. of energised pump sets (cumulative)	Rate of Growth
(1)	(2)	(3)	(4)	(5)
1972-73	346	—	1,402	—
1973-74	405	17.05	1,793	27.89
1974-75	472	16.54	2,199	22.64
1975-76	516	9.32	2,489	13.18
1976-77	557	7.95	2,905	16.71
1977-78 (estimated)	628	12.72	3,489	20.10

*In case the remote blocks of Bijapur and Narayanpur tehsils are excluded from the rural electrification schemes in the perspective plan, this would not imply violation of the objective of extending electricity lines to distant areas. There are quite a few remote blocks in other tehsils with relatively higher development potential and can be taken up as geographically contiguous clusters by extending the existing transmission lines.

†However, it should be noted that our data are blockwise whereas electrification is a settlement attribute. Hence, our priorities of the blocks though broadly correct may not be entirely in conformity with the existing boundaries.

It may be seen that the growth rate in both the districts have slowed down during 1975-77. The projection for the year 1977-78 has been made by using the average of the rates of growth for the earlier four years as has been done in case of the number of villages electrified. The following two Tables 5.10 and 5.11 give the simple annual rates of growth of electrified villages and pump sets energised in Bastar and Chandrapur and their respective States together with the national figure:

TABLE 5.10 PROGRESS OF RURAL ELECTRIFICATION FOR AGRICULTURAL DEVELOPMENT IN MADHYA PRADESH, MAHARASHTRA, BASTAR AND CHANDRAPUR

	<i>Growth rates of villages electrified during 1977-78</i>	<i>Growth rates of pump sets energised during 1977-78</i>	<i>Pump sets per electrified village 1977 1978</i>	<i>Percentage of villages electrified 1978</i>	
(1)	(2)	(3)	(4)	(5)	(6)
Madhya Pradesh	18.23	19.77	13.03	13.20	23.10
Maharashtra	6.30	8.89	22.21	22.75	60.00
Bastar	21.34*	138.70*	2.75	—	—
Chandrapur	12.95*	41.13*	5.06	—	—

*The actual growth rates for 1977-78 are not available, hence an average of the simple annual rates of growth during 1969-70 to 1976-77 have been given as an estimate.

TABLE 5.11 PROGRESS OF RURAL ELECTRIFICATION FOR AGRICULTURAL DEVELOPMENT IN THE COUNTRY

<i>Years</i>	<i>No. of villages electrified (cumulative)</i>	<i>Simple growth rate (annual)</i>	<i>No. of pump- sets energised (cumulative)</i>	<i>Simple growth rate (annual)</i>	<i>Pump sets electrified per village</i>
(1)	(2)	(3)	(4)	(5)	(6)
1950-51	3,061	—	21,000	—	6.86
1955-56	7,294	27.66	56,056	33.39	20.06
1960-61	21,750	39.64	1,98,904	50.97	9.14
1965-66	45,144	21.51	5,12,756	31.56	11.35
1968-69	73,732	21.11	10,88,804	37.45	14.77
1973-74	1,56,729	22.51	24,26,133	24.56	15.48
1974-75	1,72,169	9.85	26,119,82	7.66	15.17
1975-76	1,85,806	7.92	27,929,60	6.93	15.03
1976-77	2,02,869	9.18	30,413,05	8.89	14.99
1977-78	2,16,500	6.72	32,996,57	8.49	15.24

Projections of the number of energised pump sets during the plan period can now be taken up. We have already obtained an estimate of the number of villages to be electrified during the period. At the same time we know the number of potential wells in an average village in different blocks computed based on data on groundwater potential. It is very tempting to get the figure for energised pump sets by multiplying the two. This, however, may lead to gross over estimation as the past performance of the district does not leave much scope to hold that during the next five years it would be possible to develop minor irrigation to its 100 per cent potential. It may be seen in the above Table that while the number of pump sets energised for electrified village happens to be 15.7, 13.0 and 22.2 for India, Madhya Pradesh and Maharashtra respectively, corresponding figures for Bastar and Chandrapur are 2.8 and 5.1. It is thus evident that the farmers in the two districts are not coming forward to take advantage of electricity connections through energisation of their pump sets (or using it for domestic purposes). There is a large number of villages in both the districts where despite the electricity connection not even a single pump set has been energised. It would, thus, be erroneous to make predictions about the energised pump sets based on the groundwater potential alone. The constraints of a tribal economy and the ineffectiveness of government machinery will have to be taken into account in this prediction exercise.

It would also be inappropriate to suppose the response of the farmers with regard to energising pump sets similar to what has been in the past. This would assume no extra planning effort and lead to the development of less than one-tenth of the groundwater potential even when the required number of villages are electrified. In view of the pronounced policy of the government to develop groundwater potential while increasing the area under cultivation and also area under specific crops like sugarcane, pulses, etc., it would be natural to expect a vigorous drive to motivate the farmers to energise the pump sets through direct and indirect measures. For Bastar it is assumed that average number of energised pump sets will reach a figure of 13.14 by 1983. This does not appear to be unreasonable since the figure 13.14 holds for Madhya Pradesh in the year 1977. The figure for Madhya Pradesh is much below the national figure and it would not be unreasonable to expect that Bastar would reach this level within a lapse of 5 years, given the desired political will. It must be mentioned here that it is being proposed that this average figure will be achieved only in villages electrified during or before 1978. Because of the time lag involved in the development of agricultural load, it is evident that villages electrified during the period would have lesser number of electricity connections, on an average, than 13.14.

It is assumed that for an average village electrified on or before 1978, the number of energised pump sets will increase at an exponential rate from 2.75 in 1977 (which has been taken as 2.81 for 1978) to 13.14 in 1983. The

time profile for the average number of pump sets for these 224 villages can be worked out as shown in Table 5.12 (col. 4). Similarly the time profile for the villages electrified during 1978-83 has been obtained (col. 6) with the assumption that the average village will have a load of 13.14 only after five years of electrification.

TABLE 5.12 ESTIMATED NUMBER OF PUMP SETS DURING 1978-83
IN BASTAR : TOTAL

T	Years	No. of villages electrified before the Plan period	Average No. of pump sets per village	New villages electrified	Average No. of pump sets for new villages	Total No. of pump sets
		V_T	P_T	N_T	Q_T	R_T
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1978-79	224	3.75	108	2.80	1,142
2	1979-80	224	5.14	127	3.75	1,912
3	1980-81	224	7.03	150	5.14	3,026
4	1981-82	224	9.64	178	7.03	4,632
5	1982-83	224	13.14	209	9.64	6,901

The total number of pump sets for a particular year has been obtained by aggregating two things: (a) product of the number of villages electrified on or before 1978-79 with the relevant figure for average number of pump sets and (b) villages electrified during the plan period in different years multiplied by the corresponding number of pump sets. For the K^{th} year the R_T would be obtained as:

$$R_T = V_T \cdot P_T + \sum_{i=0}^{t-1} N_{T-i} \cdot Q_{i+1}$$

In view of the initial bottlenecks to development in the district, the plan has been revised (Table 5.13). It may be noted that in the Revised Plan the target of average number of pump sets per village has been taken to be 9.64 for the old villages and 7.03 for the new villages. This assumes that the old and the new villages will reach the target of 13.14 by 1983-84 and 1984-85 respectively. This additional allowance of one year has been given in case of Bastar in view of the initial problem of tribal economy and the institutional bottlenecks in its agrarian system. The implicit assumption here is that the agricultural connections would come up in a village]

only after one year of electrification.

TABLE 5.13 A REVISED PLAN FOR AGRICULTURAL PUMP SETS DURING 1978-83 IN BASTAR: TOTAL

	<i>Years</i>	<i>No. of villages electrified before the plan period</i>	<i>Average No. of pump sets per village</i>	<i>New villages electrified</i>	<i>Average No. of pump sets for new villages</i>	<i>Total No. of pump sets</i>
T		<i>V_T</i>	<i>P_T</i>	<i>N_T</i>	<i>Q_T</i>	<i>R_T</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1978-79	224	3.75	108	2.80	1,142
	1979-80					
2	1980-81	224	5.14	127	3.75	1,912
3	1981-82	224	7.03	150	5.14	3,026
4	1982-83	224	9.64	178	7.03	4,632

A separate exercise has been carried out to find out the number of villages electrified in the first phase, *i.e.*, the first priority blocks. The time profile of the number of villages to be electrified in different years and energised pump sets is given in Table 5.13(a).

TABLE 5.13(a) ESTIMATED NUMBER OF PUMP SETS DURING 1978-83 IN BASTAR: PHASE I (REVISED)

Years	New villages electrified	Average number of pump sets for new villages	Total No. of pump sets
(1)	(2)	(3)	(4)
1978-79	65	2.80	1,022
1979-80			
1980-81	84	3.75	1,630
1981-82	108	5.14	2,526
1982-83	140	7.03	3,845

It has been observed that the number of pump sets per electrified village in case of Chandrapur happens to be much below the State average—the two figures being 5.06 and 22.21 respectively. It would be sheer

optimism to expect Chandrapur to reach the State average by 1982-83. It is assumed that Chandrapur being structurally and physically different from an average district of Maharashtra, the former would not reach the State average of 1977 even by 1983. It is, therefore, assumed that villages electrified during or before 1977-78 would reach the present national average (and not the State average) of 15.2 energised pump sets per village by 1982-83. The time path here also has been assumed to be exponential, the base being given by the estimated figure for 1978, *i.e.*, 5.02, the annual rate of growth works out as .2017. The following Table 5.14 gives the time profile of the growth of pump sets over the years of the perspective plan.

TABLE 5.14 ESTIMATED NUMBER OF PUMP SETS DURING 1978-83
IN CHANDRAPUR

	Years	No. of villages electrified before the plan period	Average No. of pump sets per village	New villages electrified	Average No. of pump sets for new villages	Total No. of pump sets (cumulative)
T		V_T	P_T	N_T	Q_T	R_T
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1978-79	627	6.8	111	5.0	4,819
2	1979-80	627	8.3	131	6.2	6,571
3	1980-81	627	10.2	155	7.8	8,836
4	1981-82	627	12.5	182	9.8	11,793
5	1982-83	627	15.2	214	12.2	15,575

Here also the total number of pump sets (R_T) has been calculated following the method discussed in case of Bastar.

The number of pump sets in different years of the perspective plan period now being known, it is possible to project the connected load for agriculture. An analysis of Tables 5.15 and 5.16 shows that there are significant inter-block variations in the average connected load per pump set in both the districts. In Bastar, for example, there are blocks like Dantewada where connected load per pump set increases from 6.20 in the first year of village electrification to 11.35 in the fifth year. Such increases although not of similar magnitude are discernible in case of Bakawand, Durgakondal, Kanker, Sarona and Kondagaon. In other blocks there is a marginal fall or stability in the connected load. In general it can be said that for the district as a whole the connected load per pump set increases steadily but slowly during the first five year of electrification.

In case of Chandrapur too, similar inter-block variation is observed although the disparity is not of that high order. Overtime there is no

TABLE 5.15 CONNECTED LOAD PER AGRICULTURAL CONNECTION IN BASTAR (DATA FOR SUCCESSIVE YEARS)

<i>Name of block</i>	<i>Ist year</i>	<i>IInd year</i>	<i>IIIrd year</i>	<i>IVth year</i>	<i>Vth year</i>
(1)	(2)	(3)	(4)	(5)	(6)
Jagdapur	4.63	4.63	3.64	4.64	4.05
Bastar	6.83	6.08	5.30	6.10	6.15
Bakawand	2.75	2.75	2.75	2.75	6.75
Tokapal	6.19	4.36	5.30	5.25	6.50
Lohandiguda	6.57	5.00	5.84	—	—
Bastanar	5.00	—	—	—	—
Bhanupratappur	4.33	3.28	3.28	3.51	3.51
Durgakonal	2.96	3.41	3.41	3.41	3.41
Kanker	3.44	3.92	3.72	3.83	3.84
Charama	4.59	3.57	3.25	3.88	3.43
Sarona	3.84	3.73	3.59	3.48	4.03
Narayanpur	3.33	3.00	3.03	3.00	3.00
Keshkal	3.50	3.50	3.33	3.33	3.33
Geedam	7.00	4.63	5.25	5.25	—
Kuakonda	5.33	5.33	3.00	—	—
Kondagaon	3.63	4.89	3.62	3.62	4.13
Dantewada	6.20	8.92	6.35	11.35	11.35
District	3.89	4.01	3.82	4.08	4.17

significant trend which can be useful for projections. The connected load per pump set works out as 3.78 HP for the district both for 1972-73 and 1976-77. While in case of some blocks there is marginal improvement overtime; in others it falls. It can, therefore, be inferred that the connected load per pump set has more or less stabilised in the district and would be around 4 HP for the perspective plan year. Thus, the average connected load per pump set for Chandrapur comes significantly lower than the corresponding figure for Bastar in the year 1976-77, the latter figure being 4.81. This can be attributed to a number of factors. First, the size of land holding is high in case of Bastar. Secondly, pump sets have been set up only by a few 'progressive' farmers and pump irrigation has not become widely acceptable in Bastar compared to Chandrapur.

To explain the inter-block variations of the connected load in agriculture; a regression analysis has been attempted as discussed above. The results of the exercise are very interesting. In case of Bastar, there are three variables that come out with positive regression coefficients although only one happens to be significant at one per cent level. The

TABLE 5.16 CONNECTED LOAD PER AGRICULTURE CONNECTION IN CHANDRAPUR

Name of block	Upto 1972-73	During				Upto 1976-77
		1973-74	1974-75	1975-76	1976-77	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	5.07	6.44	3.70	5.33	3.61	4.66
Mul	3.94	3.89	N.A.	3.86	3.29	4.87
Gondpipri	3.51	3.90	5.03	3.45	3.00	3.92
Warora	2.51	2.61	2.56	2.62	2.60	2.49
Bhadravati	2.25	2.25	2.25	2.25	2.25	2.25
Chimur	2.25	2.25	2.25	2.25	2.25	2.25
Brahmapuri	3.49	4.00	4.44	5.52	4.24	3.97
Sindewahi	4.20	3.89	4.94	3.89	3.17	4.39
Nagbhid	4.33	3.72	3.34	3.76	3.71	3.83
Gadchiroli	3.00	3.67	3.80	3.70	3.00	3.63
Armori	3.87	3.60	3.75	9.00	3.64	4.17
Chamorshi	3.21	3.67	4.00	—	3.00	3.32
Kurkheda	4.00	4.83	4.17	5.00	4.56	4.52
Sironcha	5.00	—	—	—	—	5.00
Aheri	5.06	4.58	2.82	4.13	3.00	3.93
Rajura	2.82	3.92	3.16	2.88	3.24	3.26
District	3.78	4.47	4.07	3.73	3.36	3.78

regression model has been obtained as: (see Explanation of *Inter Block Variation in Connected load* in this chapter).

$$Y_a = -13.25 + 4.34 X_1 + 25.71 X_{10} + .003 X_{17}$$

where X_1 , X_{10} and X_{17} are number of agricultural connections, number of hospitals and output of oilseeds (in quintals).

Excluding the statistically non-significant variables, the regression equation for Bastar can be estimated afresh as:

$$Y_a = 25.0 + 3.93 X_1$$

For Chandrapur the regression equation works out to be:

$$Y_a = -34.48 + 3.16 X_1 + .15 X_3$$

where X_3 is the number of domestic connections. Excluding the statisti-

cally non-significant variable X_3 , the regression equation for Chandrapur becomes

$$Y_a = 1.16 + 3.82 X_1$$

It is amply clear that the marginal impact of an increase in the number of connections on the connected load is more for Bastar when compared to Chandrapur. The marginal load per connection for Bastar can be safely taken as above 4 HP because of the presence of other explanatory variables in the model with positive regression coefficients. In case of Chandrapur this should be more than 3.5 HP.

The block level analysis, with cross-sectional data is not, however, appropriate for making temporal projections because of the dynamic factors operating over time. It would be reasonable to assume that the connected load per pump set would increase during the perspective plan period in Bastar as the irrigation becomes much more common and the cropping intensity increases in the district. The increase, however, cannot be phenomenal because with a larger number of pums-sets coming up, small farmers with small land holdings will be the adopters. This would imply a larger proportion of pump sets with low horse power. That is why the figures for the better blocks (with high connected load per connection) like Dantewada, etc., have not been used in making projections for the connected load during the perspective plan period. Instead, the load figures for the fifth year after electrification for two representative blocks, *i.e.*, Jagdalpur and Bastar have been averaged to obtain the terminal year figure for the perspective plan period. It is thus estimated that the pump sets installed at any point of time would have an average of 5.11 HP after 5 years. It is assumed that the connected load will increase from an average of 5.11 HP, the actual figure for 1976-77 (at an exponential rate) to the target of 5.11 HP by 1982-83 for the old pump sets while the new ones will reach this figure *i.e.* 5.11 HP after five years of installation.

The total connected load in different years of the perspective plan period has been computed in Table 5.17. Besides, a second exercise has

TABLE 5.17 DEVELOPMENT OF CONNECTED LOAD IN BASTAR

<i>Years</i>	<i>Pump sets coming up on or before 1977-78</i>	<i>Connected load</i>	<i>New pump sets</i>	<i>Connected load</i>	<i>Total connected load (HP)</i>
(1)	(2)	(3)	(4)	(5)	(6)
1978-79	628	4.87	514	4.81	5,530
1979-80	628	4.93	770	4.87	9,303
1980-81	628	4.99	1,114	4.93	14,776
1981-82	628	5.05	1,606	4.99	22,682
1982-83	628	5.11	2,269	5.05	33,874

been attempted to work out the connected load for the villages to be covered under phase I. Table 5.18 gives the details. It must be mentioned that projections of connected load per pump set has not been made for different blocks separately as there is no definite pattern of inter-block variation.

TABLE 5.18 DEVELOPMENT OF CONNECTED LOAD FOR BASTAR (PHASE I)

<i>Years</i>	<i>New pump sets</i>	<i>Connected load</i>	<i>Total connected load (in HP)</i>
(1)	(2)	(3)	(4)
1978-79	395	4.81	4,958
1979-80	608	4.87	7,944
1980-81	896	4.93	12,352
1981-82	1,319	4.99	18,848
1982-83	1,902	5.05	28,227

For making projections for the district of Chandrapur it has been assumed that the load per pump set would on an average be 3.78 HP independent of the block or the number of years after energisation. The time profile of the connected load for agriculture is given in Table 5.19.

TABLE 5.19 DEVELOPMENT OF CONNECTED LOAD IN CHANDRAPUR

<i>Years</i>	<i>Pump sets coming up during 1977-78</i>	<i>New pump sets</i>	<i>Load for new and old pump sets</i>	<i>Total connected load (in HP)</i>
(1)	(2)	(3)	(4)	(5)
1978-79	3,489	1,330	3.78	18,216
1979-80	3,489	1,752	3.78	24,838
1980-81	3,489	2,265	3.78	33,400
1981-82	3,489	2,957	3.78	44,577
1982-83	3,489	3,782	3.78	58,873

Projecting Electricity Demand for the Development of Industrial Sector in Bastar and Chandrapur

Making projections of the numbers of connections and connected load for industries is more complex. This is so because there is no definite trend in either and there is considerable fluctuation over the blocks cross-sectionally. An attempt, however, has been made to estimate the connected load and number of connections using the past data through regression

analysis. It has been possible to consider data for only nine of the 20 electrified blocks since the time profile of the number of connections and connected load are not available for an adequate number of years for other electrified blocks. Even for the nine blocks included in the analysis the results are highly unsatisfactory. A linear trend $Y=a+bt$ has been fitted taking time as the explanatory variable (Y is the number of connections and connected load in rural areas) (Table 5.20). Regression coefficient \hat{b} for five blocks namely, Jagdalpur, Dantewada, Geedam, Narayanpur and Sarona comes out positive although the values are very low ranging from .005 to .018. This implies that within the time span of 5 to 6 years, the expected number of rural industrial units in these blocks would be very low. In case of other blocks, the \hat{b} values are negative. Similarly, the regression coefficients \hat{b} for projecting the connected load in rural areas for industrial use are very low. This suggests that regression analysis has very limited use in making projections for future in the given context.

TABLE 5.20 RESULTS OF REGRESSION ANALYSIS (\hat{b} VALUES ONLY)
ELECTRICITY FOR INDUSTRIAL USE IN BASTAR
MODEL: $Y=a+bt$

<i>Name of block</i>	<i>Number of connections</i>	<i>Connected load</i>
(1)	(2)	(3)
Jagdalpur	.018	.82
Bastar	— .006	— .09
Dantewada	.007	.47
Geedam	.002	.03
Kondagaon	— .004	— 1.94
Narayanpur	.005	.69
Charama	— .023	— .19
Sarona	.005	.04
Bhanupratappur	— .012	— .26

The nature of activities in the district that use electricity is much more diversified in the industrial sector as compared to agriculture. This is another important reason why projections of total load and number of connections based on past trend of aggregative data of all industries would give misleading picture. It is desirable that the number of units of different industries are projected separately. In this context end-use method, past trend and analysis of income-population elasticity have been considered relevant. Once the number of industrial units are projected, it should be possible to work out the total connected load and its tehsilwise break-up.

End-use method is suited for projecting the number of units for industries that use a few (one or two preferably) inputs and the capacity or the number of units is dependent on the output of the raw material. Evidently, in making projection for the agro-based industries the method would be relevant since given the output of different agricultural produce the number of units for corresponding agro-based industries can be worked out using some input-output norms.

In case of industries for which demand is primarily exogenous to the region or the demand is changing in response to socio-economic changes overtime not directly quantifiable, it may be appropriate to project the number of units on the basis of the past trends.

Finally, there are industrial units whose growth is contingent upon demand which in turn is a function of future population and per capita income. For these units, the output of the relevant raw material is not important as part of it might be imported/exported or used elsewhere. In case of these industrial units, projections may be made on the basis of population and per capita income trends.

In case of Bastar district the industries have been grouped under seven broad categories. These are: (i) rice mills, (ii) oil mills, (iii) flour mills and bakery, (iv) ice factory and cold storage, (v) saw mills (mechanized/steel) and wooden furniture manufacturing, (vi) welding/engineering, tyre/tube retreading and motor repairing, and (vii) miscellaneous.

For projecting the number of units in the first two industries, end-use method has been considered suitable since the number of units have definite relations with the output of paddy or oilseeds and also cereals other than paddy. The procedure is discussed below.

Step I: The total gross cropped area for the district has been projected for the year 1982-83. For this the average of the rate of growth of Gross Cropped Area (GCA) during the years from 1969-70 to 1976-77 has been computed which works out to be 1.48 per annum. The rate has been revised upto 1.78 to account for the irrigational development in the district. This rate of growth compounded annually, when applied to the base of 7,70,833 hectares in the year 1976-77 gives the GCA for the year 1982-83 as 8,56,910 hectares. It is assumed that the area under paddy, oilseeds and other cereals would grow at the above average rate giving the GCA figures as 5,11,237, 41,090 and 2,31,100 hectares respectively for the three crops for the year, 1982-83.

Step II: An attempt has been made to project the gross area under irrigation for the year 1982-83. This has been obtained by aggregating proposed area under irrigation under minor and medium schemes (major irrigation schemes being absent in the district). Using the norm of 2 hectares per energised pump set with 6,273 additional pump sets coming up in the district, the area under tube wells irrigation would be 12,546 hectares by 1982-83. This when added to the proposed areas of 41,356 hectares under

other schemes, gives the total addition to irrigated land during the planning period as 53,902 hectares. This added to the estimated area under irrigation in the year 1977-78 of 10,881* gives the total irrigated area as 64,783. Thus, we shall have 7.56 per cent of the total area under irrigation by the end of 1982-83.

Stage III: An estimation of the area under irrigation for paddy, oilseeds and other cereals has been made using the average rate of growth of the total irrigated area obtained in stage II. This evidently assumes that irrigation under these crops would increase at a uniform rate.

The average productivity per hectare of GCA has been obtained for the district for the above three crops on the basis of impact of irrigation on output. Thus, an estimation has been made for the productivity of land per hectare of GCA with and without irrigation for the three crops in the district. The distribution of GCA and productivity figures for the three crops are given in Table 5.21. From this an estimate has been made of the total output of the three crops.

TABLE 5.21 PROJECTED AREA AND PRODUCTIVITY IN BASTAR, 1982-83

Item	Paddy		Other Cereals		Oil seeds	
	Irrigated	Unirrigated	Irrigated	Unirrigated	Irrigated	Unirrigated
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Area (hectare)	40,729	4,70,233	8,895	2,28,235	43	41,491
Productivity (metric tonnes per hectare)	1,360	850	1,805	960	480	250
Production (metric tonnes)	24,55,089		2,35,161		10,393	

Step IV: The elasticity of output with respect to irrigation has been worked out from the national figure. This works out to be .6 which implies that with every 10 per cent increase in irrigation the output will increase by 6 per cent. Assuming all-India average figure to be valid for Bastar in this specific context, the output projections have been made for the three crops using three different elasticity figures. This has been adjusted in view of the output projections made in the preceding step.

*Irrigated area for the year 1977-78 is not available hence has been estimated using the past trend.

The Table 5.22 shows the distribution of small scale industrial units (registered) together with some of the villages and cooperative industrial enterprises using electricity at two points of time 1971 and 1977. It may be seen that the output of paddy and oil seeds has increased by 28 and 62 per cent respectively during the perspective plan period. Based on the assumption that rice and oil mills would increase at these rates, projections of the rice mills and oil mills can be made. It must be mentioned here that the rate of growth proposed for the perspective plan period is much lower than the corresponding trend rate which calls for an explanation. In case of paddy it may be seen that its output has declined during 1973-74 and 1975-76. However, on the face of falling paddy crop the number of rice mills has expanded at a high rate. Besides, some of the expansion in rice milling could be in response to a record paddy output of 4,84,000 tonnes in 1975-76. It is, therefore, not very realistic to expect the past rate of growth to continue in future.

TABLE 5.22 DISTRIBUTION OF INDUSTRIAL UNITS IN BASTAR

Unit	1971		1977	
	Rural	Urban	Rural	Urban
(1)	(2)	(3)	(4)	(5)
Rice mill	32	29	47	53
Oil seed	3	4	10	11
Flour and bakery	31	27	53	65
Saw mill, furniture	10	9	17	23
Welding, engineering, tyre/tube, motor repairing	4	12	9	39
Ice factory and cold storage	2	3	2	3
Miscellaneous	4	10	10	28

In early seventies, paddy output was also milled outside the district and through local methods within the district. The diversion of this output to the mill sector has taken place during mid-seventies which is responsible for the setting-up of rice mills in the rural areas despite fluctuations in paddy production. For making future projections it would be more reasonable to expect that the new units during 1978-83 would come up in relation to the increase in output.

The case of oil seeds is similar. Here the record output was attained in 1974-75, i.e., 13.6 thousand tonnes after which the figure has continuously fallen. During 1971-77, the oil seed production has been reduced to its 50 per cent level while the number of oil mills has trebled. This makes it

amply clear that past growth rate would be of dubious validity for projection purposes. It would once again be realistic to expect that new oil mills during 1978-83 would come in response to increase in the indigenous output.

For saw mills, engineering and transport, etc., the past trend appears reasonable enough to be considered for projection. These sectors are expanding mainly in response to the demand from outside the district. Assuming a similar pattern of interaction of the region with the rest of economy one can use the past trends with some degree of confidence in making future projections. In case of flour mills, bakery, etc., also the past trends appear relevant. The growth of this sector is also a function of modernization which is largely exogenous to the system.

In view of the variety of new consumer goods industries coming up in the district it is proposed to project the growth of the miscellaneous goods sector in a different manner. The growth profile of this sector in Jagdalpur tehsil may be taken as a proxy for the growth of the sector in the entire district. The projected figure, however, does not come out to be significantly different from the projection based on district level data. This is because in other tehsils too the miscellaneous industries have been coming up in the past.

The most recent figure for small scale registered industrial units pertains to situation as on March 1979 (Appendix 5.1). It may be noted that the growth rates during 1978-79, by and large, correspond to the past trends and confirms the observations made above regarding the growth of different industries.

For making projections of ice factory, income and population criteria have been used. Assuming population to grow at the rate of 2.8 per cent per annum and per capita income at the rate of 1.2 per cent per annum, a growth rate of 4 per cent has been applied to ice factories in this region to get the projected number of units. Table 5.23 gives the projected number of units under the seven industrial categories for the year 1982-83. It may be seen that in the past there has been a significant bias in favour of the urban centres in locating these industrial units. Although there are only three urban centres and about 3,484 villages in the district, about 53 per cent of the industrial units have been located in the urban areas in 1971, the percentage becoming 68 in 1977. In the blocks like Jagdalpur the concentration of these units in urban areas is even worse. This is certainly a disturbing trend which needs to be corrected. It is necessary to allot a larger share of incremental industrial units to the rural areas so that the disparity could be reduced and rural development can take place in its proper perspective. Such a structural change would be in keeping with the policy of rural development for the Sixth Five Year Plan. Besides, the massive rural electrification programme as suggested in this study for the

rural areas would provide the basic economic infrastructure to make such shifts in favour of the rural areas possible.

TABLE 5.23 PROJECTED PATTERN OF INDUSTRIES IN BASTAR BY 1982-83

Unit	Method used in projection	Total	Incremental units to be established during 1977-83	
			Rural	Urban
(1)	(2)	(3)	(4)	(5)
Rice mills	Output criterion	159	47	12
Oil mills	"	34	10	3
Flour and bakery	Past trend	269	115	29
Saw mills, furniture	Past trend	44	35	9
Welding, engineering, tyre/tube & motor repair	Past trend	114	18	78
Ice factory and cold storage	Income criterion	6	—	1
Miscellaneous	Past trend	103	17	48

In case of rice mills, oil mills, saw mills, flour/bakery, etc., that are rooted in the local resources, it is proposed that the 80 per cent of the new units be set up in the rural areas. In case of others, the proportion existing in 1977 has been used in distributing the incremental industrial units between the rural and urban areas.

Projections for industrial units in the district of Chandrapur for the terminal year 1982-83 has been attempted in this section, the methodology being same as that of Bastar. Here also a regression analysis taking number of connections and connected load as dependent variables and time as an independent variable was attempted. The results could not be used for projections for reasons already stated above. Table 5.24 gives the results of regression analysis. It may be seen that the regression coefficients are very low and lack a pattern. It has been considered appropriate to make projections for different types of industrial units separately as was done for Bastar. Industrial units were grouped once again up to seven categories although the classification scheme is slightly different from that of Bastar. The seven categories are (i) Rice and poha mills, (ii) Oil mills, (iii) Flour and dal mills and bakery, (iv) Saw mills, mechanical and steel furniture manufacturing, etc., (v) Chemicals, tiles and crockery, (vi) Ice factory, and (vii) miscellaneous including printing press and motor repairing units. It may be seen that chemicals, tiles and crockery manufacturing

TABLE 5.24 RESULTS OF REGRESSION ANALYSIS (β VALUES ONLY)
ELECTRICITY FOR INDUSTRIAL USE IN CHANDRAPUR
MODEL: $Y=a+bt$

<i>Name of block</i>	<i>No. of connections</i>	<i>Connected load</i>
(1)	(2)	(3)
Chandrapur	+ .053	+ .52
Mul	— .031	— .45
Gondpipri	+ .022	+ .25
Bhadrawati	+ .008	+ .10
Chimur	— .050	— .36
Brahmapuri	— .035	— .41
Sindewahi	+ .029	+ .42
Nagbhid	— .039	— .48
Gadchiroli	+ .020	+ .28
Armori	— .038	— .54
Chamorshi	+ .017	+ .29
Kurkheda	+ .024	+ .11
Sironcha	— .004	— .03
Aheri	+ .011	+ .13
Rajura	— .026	— .28

emerge as a major sector in Chandrapur. On the other hand, tyre retreading, motor repairing, etc., are not very important which are major components of the industrial sector in Bastar. There is only one motor repairing unit in Chandrapur in 1971 and there has been no addition to this during the seventies. Hence, this has been merged with miscellaneous sector, the latter including the printing presses.

The overall growth rate of the industrial units is much higher in Chandrapur as compared to Bastar, the two simple rates of growth being 22.27 and 12.68 respectively. The rate of growth of non-household workers as seen in the census data also shows a higher rate of growth for the economy of Chandrapur. The per cent increase in the non-household workers to rural population during sixties has been .26 which is identical with the national average while for Bastar the figure is negative. In the towns of Chandrapur non-household workers have grown at the rate of 3 per hundred population which is ten times the corresponding figure for Bastar or the country as a whole. This suggests that there is scope for the development of the industrial sector in Chandrapur during the perspective plan period.

For estimating the output of three crops, viz., rice, other cereals and oil-seeds, a method identical to that used in Bastar has been followed here. An estimation was made of the total irrigated land at the end of the Fifth Five Year Plan and the end of the Sixth Five Year Plan. The area under

irrigation during the period 1974-75 was 110 thousand hectares. This was added to the estimated area under irrigation under different major and medium projects like Itiadoh, Chargaon Nalla and Chandai Nalla to be completed during 1975-78. We also have the figures for the estimated number of pump sets coming up during 1975-78 which multiplied by the average area irrigated per tube well (*i.e.*, 2 hectares) give the additional area under private irrigation system. The total figure for 1978 thus works out as 1,644 thousand hectares which gives the percentage figure of 23.7 of land under irrigation. It needs to be mentioned that it has been proposed to irrigate 30 per cent of the GCA by the end of the Fifth Five Year Plan.¹ It is evident that the actual achievements would fall short of the target, the latter being 207.5 thousand hectare.

For making projections of the additional area under irrigation during the Sixth Five Year Plan period, information regarding the proposed schemes and their corresponding area have been obtained. To this we have added the area figures to be brought under cultivation through the additional pump sets to be installed during this period. The total irrigated area thus comes to be 2,52,241 hectares which is somewhat lower and perhaps more realistic than what has been projected in Eco-system Plan for Chandrapur. The (simple) rate of growth of irrigation thus works out to be 129 per cent during the period, 1977-83.

The elasticity of output with respect to irrigation for India has been obtained and is assumed to be valid for district level projections. The corrections of the (projected) output figure through separate estimations based on irrigated and unirrigated lands and their productivity figures (as has been attempted for Bastar) is considered unnecessary here since the average percentage of irrigation in the district is similar to that of the country as a whole. The growth of output for the three crops thus works out to be around 13 per cent. This rate of growth has been used for making projections of rice and poha mills and oil mills (Table 5.25).

The estimates for the number of units for saw mills, chemicals, tiles, crockery and ice factory have been obtained through trend line projections. The reasons for using this method for these activities have already been discussed in the context of Bastar.

The miscellaneous industries are expected to grow at a faster rate than observed in the past because of the diversification of industrial base under the impact of the strategies recommended during the perspective plan period. As in case of Bastar, for Chandrapur too a relatively developed tehsil has been selected to work out the rate of growth for this sector. This rate has been used to make projections for the sector for the entire district. Table 5.26 gives the projected number of units of different sectors in the year 1982-83.

¹Lead Bank Report.

TABLE 5.25 DISTRIBUTION OF INDUSTRIAL UNITS IN CHANDRAPUR

<i>Unit</i>	<i>1971</i>	<i>1977</i>
(1)	(2)	(3)
Rice and poha mills	72	168
Oil mills	31	72
Flour and dal mills and Bakery	207	469
Saw mills, mechanical and steel furniture manufacturing etc.	68	133
Ceramics, tiles and crockery	20	54
Ice factory	6	14
Miscellaneous	39	126
Total	442	1,035

TABLE 5.26 PROJECTED PATTERN OF INDUSTRIES IN CHANDRAPUR

<i>Unit</i>	<i>Method used in projection</i>	<i>Projected number (1983)</i>	<i>Incremental units to be established during 1977-83</i>	
			<i>Rural</i>	<i>Urban</i>
(1)	(2)	(3)	(4)	(5)
Rice and poha mills	End use	396	182	45
Oil mills	"	167	76	20
Flour and dal mills	Past trend	1,049	464	116
Saw mills, mechanical and steel furniture manufacturing etc.	"	33	1	18
Ceramics, tiles and crockery	"	258	100	25
Ice factory	"	150	85	22
Miscellaneous	Trend in the relatively advanced tehsils	553	205	221

The number of proposed units being thus determined, it is now possible to project the connected load for the industrial units, basing on the average connected load figure for different units. The following Table 5.27 gives the average connected load for the two districts.

It may be seen that the connected load for different industries in the two districts is taken to be the same except in case of rice and oil mills and

TABLE 5.27 AVERAGE CONNECTED LOAD FOR DIFFERENT INDUSTRIAL UNITS PROPOSED DURING 1978-83: BASTAR AND CHANDRAPUR

Unit	(in HP)	
	Bastar	Chandrapur
(1)	(2)	(3)
Rice mills*	30	35
Oil mills*	30	20
Flour mills	15	15
Saw mills	20	20
Ceramics and chemicals	20	20
Ice factory	30	30
Transport, repair, tyre and general engineering	8	8
Miscellaneous*	10	20

NOTE: The units with asterisk marks have different norms in the two districts.

miscellaneous industries. The reasons for taking these different norms are to do with technical differences in the existing units. As the existing norms for the mills have been used for projecting the future connected load, the disparity in their average power consumption has been maintained. In case of miscellaneous industries a higher value of connected load has been taken for Chandrapur in view of the large and medium scale industries proposed in the plan (Appendices 5.2, 5.3 and 5.4). It may be noted that two units of paper; one unit of rayon pulp and one unit of solvent extraction have been proposed under the large and medium industrial schemes, and this will inflate the power consumption. However, in case of other industrial units such discrepancies are not discernible and hence uniform norms have been used. To make projections of connected load for industrial use for terminal year an attempt is made first to estimate the connected load for the year 1977-78 (the latest data being only for 1976-77) for the two districts. In case of Bastar's rural industrial sector, connected load for 1976-77 is estimated as 1,479 KW giving an annual growth rate of 14.30 per cent over the past five years. Using this growth rate the projected connected load for the year 1977-78 is taken to be 1,711 KW. Total proposed connected load for the year 1982-83 has been estimated using the average norms for different industrial units and the projected number of units. In case of Chandrapur, the connected load in rural areas for industrial use for the year 1976-77 works as 9,811 KW which gives an annual rate of growth of about 25 per cent per annum during the period 1971-77. The connected load for the year 1977-78 has been estimated on the basis of exogenous information to be 11,861 KW giving a rate of growth as 20.9

per cent over the last year figure. The additional load for the perspective industrial plan has been estimated to be 16,949 KW based on the proposed industrial development and average load figures. The additional connected load for rural industries during the perspective plan period thus works out to be 3,319 KW for Bastar and 16,949 KW for Chandrapur giving an annual compound rate of growth of 17.48 and 24.07 per cent respectively. The time profile of the connected load has been worked out using this rate of growth in Table 5.28.

TABLE 5.28 ADDITIONAL CONNECTED LOAD (KW) FOR INDUSTRIES IN THE RURAL AREAS OF BASTAR AND CHANDRAPUR

<i>Years</i>	<i>Bastar</i>	<i>Chandrapur</i>
(1)	(2)	(3)
1978-79	412	2,393
1979-80	511	2,812
1980-81	634	3,303
1981-82	786	3,881
1982-83	976	4,558
Total (incremental)	3,319	16,949

Projecting Electricity Demand for Domestic and Commercial Usages: Bastar and Chandrapur

A wide range of inter-block variation in the distribution of number of connections and connected load for domestic and commercial use was observed for the year 1976-77. While for the block like Kondagaon, the number of connections per villages electrified goes as high as 670, there are blocks like Bakawand where the corresponding figure is only unity. This suggests that the use of the cross-sectional data with their extreme values would not give dependable results.

Keeping this in view, three blocks, namely, Jagdalpur, Bastar and Kanker have been selected for making projections. These blocks have around 25 per cent of the villages electrified, and the envisaged rural electrification programme for the district aims at similar percentage of settlements being electrified by 1982-83. Hence the three blocks have been considered as representative. It is thought that the consumption pattern of electricity in the district can be estimated reliably if the norms, worked out from these three blocks, are used for projection.

In order to account for temporal variations information at three points of time have been used. The average figures of (a) connected load and

(b) number of connections for three years 1974-75, 1975-76 and 1976-77 have been considered relevant for future projections. The average number of connections (existing) in these three blocks have been aggregated and divided by the average number of villages that were enumerated as electrified in these blocks, which gives the figure of average connection per village. In a similar fashion connected load per connection for the district has been obtained using information of these three blocks only. For Bastar we find that there are on an average 12.74 connections per electrified village while connected load per connection is .32 KW for domestic and commercial usages.

For Chandrapur the blocks selected as representing the district are Chandrapur, Warora, Brahmapuri and Nagbhid. Taking the average of the same three years, viz., 1974-75, 1975-76 and 1976-77 and dividing the average connection by average number of electrified villages, an estimation has been made for the number of connections per village. Similarly the norm of average load per connection has been obtained. The norms for average connection and connected load work out to 20.80 and .32 KW, respectively.

The total number of domestic/commercial connections in the district has been obtained by multiplying the number of new villages and average number of connections obtained as mentioned above. The Tables 5.29 and 5.30 give the number of connections and connected load over the years of the perspective plan for the two districts.

TABLE 5.29 ADDITIONAL CONNECTIONS AND CONNECTED LOAD
FOR DOMESTIC AND COMMERCIAL IN THE RURAL AREAS
OF BASTAR

<i>Years</i>	<i>No. of villages electrified</i>	<i>No. of connections</i>	<i>Total connected load (KW)</i>
(1)	(2)	(3)	(4)
1978-79	108	1,376	440.3
1979-80	127	1,618	517.8
1980-81	150	1,911	611.5
1981-82	178	2,268	725.8
1982-83	209	2,663	852.2
Total for the period 1978-83	772	9,836	3,147.6

TABLE 5.30 ADDITIONAL CONNECTIONS AND CONNECTED LOAD FOR DOMESTIC AND COMMERCIAL IN THE RURAL AREAS OF CHANDRAPUR

<i>Years</i>	<i>No. of villages</i>	<i>No. of connections</i>	<i>Connected load (KW)</i>
(1)	(2)	(3)	(4)
1978-79	111	2,389	860.0
1979-80	131	2,725	981.0
1980-81	155	3,224	1,160.6
1981-82	182	3,786	1,363.0
1982-83	214	4,451	1,602.4

Projecting Electricity Demand for Street Lighting in Bastar and Chandrapur

Projections for street lighting was attempted following similar methodology. Here also the representative blocks selected were Jagdalpur, Bastar and Kanker for Bastar district and Chandrapur, Brahmapuri, Nagbhid and Warora for Chandrapur district and the three time points were 1974-75, 1975-76 and 1976-77. The average number of connections per village for Bastar for street lighting works out to be 1.45 while the corresponding figure is 6.30 for Chandrapur. The figure for connected load per connection similarly is lower in Bastar as compared to Chandrapur, the two figures being 0.04 and 0.07 KW respectively. The time profile for connected load for the two districts is shown in Tables 5.31 and 5.32.

AN OVERVIEW

In Tables 5.33 and 5.34, an attempt has been made to give the temporal profile of the connections/load development over time for the different using sectors in an attempt to summarize the results of the analysis of this chapter. Table 5.35 shows the load per connection at two points of time while Table 5.36 gives the rate of growth of connected load in different sectors before and during the perspective plan period. It may be seen that the connected load per connection in agriculture is higher in Bastar as compared to Chandrapur both before as well as during the plan period. This is so because of the higher size of land holdings in Bastar and the installation of pump sets only by a select farmers as has been argued above. The industrial load is, however higher in Chandrapur because of the existence of a few large industries. It may be interesting to note that while industrial load per connection in Bastar is expected to rise during the perspective plan period, the same would remain almost stable in Chandrapur. This is solely due to the changes in the structure of industrial composition. In Chandrapur which has a highly concentrated spatial

TABLE 5.31 TIME PROFILE OF INCREMENTAL CONNECTIONS AND CONNECTED LOAD FOR STREET LIGHTING IN THE RURAL AREAS OF BASTAR

<i>Years</i>	<i>No. of villages</i>	<i>No. of connections</i>	<i>Connected load (KW)</i>
(1)	(2)	(3)	(4)
1978-79	108	157	6.28
1979-80	127	184	7.36
1980-81	150	218	8.72
1981-82	178	258	10.32
1982-83	209	303	12.12
1978-83	772	1,120	44.80

TABLE 5.32 TIME PROFILE OF INCREMENTAL CONNECTIONS AND CONNECTED LOAD FOR STREET LIGHTING IN THE RURAL AREAS OF CHANDRAPUR

<i>Years</i>	<i>No. of villages</i>	<i>No. of connections</i>	<i>Connected load (KW)</i>
(1)	(2)	(3)	(4)
1978-79	111	699	48.93
1979-80	131	825	57.75
1980-81	155	976	68.32
1981-82	182	1,147	80.29
1982-83	214	1,348	94.36
1978-83	793	4,995	349.65

pattern of industrialization, the connected load might even go down marginally overtime with rural industrialization. The case is different for Bastar where some basic and power consuming industries have been recommended. Domestic load for Bastar in 1977-78 comes as high as .51 KW per connection. This is evidently due to low level of electrification connecting only a few 'developed' villages, block headquarters, etc. One would expect this to fall overtime. In case of Chandrapur the figure does not experience any significant change. For street lighting, however, the norm remains constant for Bastar while for Chandrapur it improves marginally.

When the sectoral rate of growth in connected load is analysed, the highest rate of growth is obtained in agriculture (Table 5.36). This is to be expected in view of the untapped groundwater potential and low percentage of land under irrigation, etc. in the two districts. The rate of growth for Bastar is 61 per cent while the corresponding figure for Chandrapur is

TABLE 5.33 TIME PROFILE OF CONNECTIONS AND LOAD FOR RURAL AREAS IN BASTAR (KW)

Years	Agriculture		Industries		Domestic/Commercial		Street lighting		No. of villages	Total load
	No.	Load	No.	Load	No.	Load	No.	Load		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1978-79	514	2,115.6	30	412	1,376	440.3	157	6.28	108	2,974
1979-80	770	3,169.3	37	511	1,618	517.8	184	7.36	127	4,206
1980-81	1,114	4,385.2	46	634	1,911	611.5	218	8.72	150	5,839
1981-82	1,606	6,610.3	58	786	2,268	725.8	258	10.32	178	8,132
1982-83	2,269	9,339.2	71	976	2,663	852.2	303	12.12	209	11,179
1978-83	6,373	25,819.6	242	3,319	9,836	3,147.6	1,120	44.80	772	32,331
Upto										
1977-78	628	2,584.8	137	1,711	5,315	2,709.6	1,191	49.43	224	7,055
Upto										
1982-83	6,901	28,404.4	379	5,030	15,151	5,857.5	2,311	94.23	996	39,386

TABLE 5.34 TIME PROFILE OF CONNECTIONS AND LOAD FOR THE RURAL AREAS IN CHANDRAPUR (KW)

Years	Agriculture		Industries		Domestic/commercial		Street lighting		No. of villages	Total load
	No.	Load	No.	Load	No.	Load	No.	Load		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1978-79	1,330	4,762.5	157	2,392.0	2,309	831.2	699	48.9	111	8,034
1979-80	1,752	6,273.6	185	2,812.0	2,725	981.0	825	57.8	131	10,125
1980-81	2,265	8,110.5	217	3,303.0	3,224	1,160.6	977	68.4	155	12,644
1981-82	2,957	10,588.4	255	3,881.0	3,786	1,363.0	1,147	80.3	182	15,913
1982-83	3,782	13,542.6	300	4,558.0	4,450	1,602.0	1,348	94.4	214	19,795
1978-83	12,086	43,277.9	1,113	16,949.0	16,494	5,937.8	4,996	349.8	793	66,515
Upto										
1977-78	3,489	10,019.0	752	11,861.0	15,620	5,955.0	6,561	369.0	627	28,204
Upto										
1982-83	15,575	53,296.6	1,865	28,810.0	32,114	11,892.8	11,557	718.8	1,420	94,719

TABLE 5.35 LOAD PER CONNECTION IN BASTAR AND CHANDRAPUR
IN 1977-78 AND 1982-83

(in KW)				
Years	Agriculture	Industries	Domestic/Commercial	Street-lighting
(1)	(2)	(3)	(4)	(5)
<i>Bastar</i>				
(a) 1977-78	4.12	12.49	0.51	0.04
(b) 1982-83	4.12	13.27	0.39	0.04
<i>Chandrapur</i>				
(a) 1977-78	2.87	15.77	0.38	0.05
(b) 1982-83	3.42	15.45	0.37	0.06

TABLE 5.36 COMPOUND RATE OF GROWTH OF CONNECTED LOAD IN
VARIOUS CONSUMPTION CATEGORIES IN BASTAR AND
CHANDRAPUR

Years	Agriculture	Industries	Domestic/commercial	Street lighting
(1)	(2)	(3)	(4)	(5)
<i>Bastar</i>				
(a) 1971-76	12.60	11.39	21.86	25.13
(b) 1978-83	61.51	24.07	16.67	14.77
<i>Chandrapur</i>				
(a) 1971-76	19.98	20.19	14.09	8.10
(b) 1978-83	36.69	20.10	14.84	14.27

40 per cent. In case the revised plan for Bastar as indicated above is taken to be more appropriate and realistic the rate of growth in agriculture works out to be 43 per cent only. Achieving this rate of growth would undoubtedly call for a massive effort on the part of the planning machinery and a strong political will which has been assumed to exist in the formulation of the perspective plan. The rate of growth of rural industries is higher in Bastar for the perspective plan period compared to the past trend. For Chandrapur, on the other hand, the rate is similar to that experienced during 1971-76. It is, however, not only the number of units but their sectoral composition which has been given due consideration in the projection. The actual rate of growth of industries is expected to be higher

than that of the connected load since a faster growth rate of rural industries not requiring electricity, have been recommended for the districts. The growth rate of domestic/commercial consumption and street lighting in Chandrapur is somewhat higher than experienced during the recent past which is expected. The corresponding growth rate for Bastar although higher than that of Chandrapur is much below the past trend growth rate. There is nothing disturbing about it since the past growth rate in Bastar is high mainly because of the low base of rural electrification in early seventies as pointed out above.

It is also interesting to note that average number of connections per village both for domestic/commercial and street lighting in the rural areas in the two districts is lower during the perspective plan period than what has been observed in the past years. It is believed that as rural electrification programmes get a proper hold of the district economy, a larger number of small and remote villages at lower levels of development will be covered bringing down the number of connections per village.

The actual connected load figures for 1977-78 and 1978-79 when compared to our projections, increase our degree of confidence regarding the exercise. In the initial years of the perspective plan the actual connected load and the projected one show marginal difference although former is lower than the latter (Appendix 5.5).

To cross examine the feasibility of our results, a comparison has been made between the proposed plan of study and the perspective plan prepared by the Operations and Maintenance (O & M) Division, Chandrapur. It may be seen that they broadly correspond with each other (Appendix 5.6) although there is significant departure in agriculture and rural industry sector.

6

Strategies for Future Development

THE FIVE YEAR PLAN 1978-83 makes an important observation in the context of the proposed strategy of rural development. The argument flows as follows: "It is relatively simple matter to prepare projects for setting up industries or power stations or expanding capacities of ports or air lines or tele-communication system. A limited number of experts, planners contractors, workers are needed to implement such schemes. A programme of rural development, on the other hand, involves investment decisions by hundreds and thousands of individuals and their ability to evoke response of millions of potential beneficiaries. Officials at all levels can only play a limited role in such an enterprise as affecting the deliveries of certain essential inputs."

Indeed, implementing the development plan for Bastar and Chandrapur is much more complex task then renovating the Delhi Airport for it calls for active participation of large section of population, a substantial portion of it being tribal whose behaviour pattern has not been very well studied. However, the conclusion that the role of the government officials becomes much more limited is not obvious. It can, on the other hand, be argued that the government machinery in such situation would have to be much more active and the strategies in implementing development plan would need to be worked out in greater detail to make an impact.

DEVELOPING AGRICULTURE IN THE DISTRICTS

The sectoral targets and the rates of growth during the perspective plan period have been computed and their implications in terms of growth of the regional economy have been discussed in the previous chapter. It has been mentioned that the proposed rates of growth in agriculture in both the districts are far greater than the trend growth rate and also that proposed for other sectors. This is in keeping with the objectives of the Sixth Five Year Plan. "The approach of this plan is to

rely to a much greater extent on the development of agriculture, village and small industries, subsidiary occupation and related services through hill area and tribal area RMN and area development programmes."

The high rate of growth of agriculture is primarily based on provision of irrigation and spread of 'water based technology'. It may be noted that number of pump sets proposed per village in Bastar by 1982-83 has been kept at 13 as against the corresponding figure of 15 for Chandrapur. When this is viewed against the present low level, it is evident that massive investment will be required specially in Bastar in major and medium irrigation schemes and developing the ground water potential. Investment of this order should be expected to flow in since a large increase in the investment in irrigation, agriculture and allied activities and power development has been visualized in the Sixth Plan (Table 6.1).

TABLE 6.1 SECTORAL STRATEGIES OF THE PLAN 1978-83

<i>Sector</i>	<i>Percentage increase in 1978-83 over the Fifth Plan</i>
(1)	(2)
Agriculture and allied activities including rural and tribal development	99.5
Irrigation and flood control	128.3
Industry and minerals	40.6
Power	103.2

The increment in investment in the districts of Bastar and Chandrapur is expected to be relatively larger than what is indicated in the above table. This is because the strategy of Rural Development focuses attention on the tribal and backward regions, the two districts under consideration qualifying on both counts.

The agricultural development of Bastar district, by and large, depends on the spread of irrigation. In this context, the following recommendations can be made that are broadly in agreement with those made in the tribal sub-plan of Bastar:

- (i) There should be more stress on irrigation schemes designed for Rabi, and the diversion schemes which are non-perennial and cater to the requirement of only Kharif crops may not be taken up. In order to meet the irrigation requirement of Rabi crop and also to save it from damage by stray cattle, preference should be given to the schemes of larger command area.

- (ii) Water should be made available at concessional rates to the non-tribal farmers who are entitled to subsidy schemes of MFAL and SFDA in other districts. The concessional water rates should be made applicable to the supply of water on demand also. However, the rich non-tribal farmers should be required to pay a higher rate.
- (iii) Currently concessional water rates are only applicable for tank and diversion schemes. Within the objective of utilising the irrigation potential to the fullest, the concessional rates should be made applicable to the lift irrigation schemes of the government as well.
- (iv) The agricultural programmes must have certain amount of flexibility. The main difficulty with a small farmer, specially a tribal is that he is shy and often reluctant to establish contact, with extension personnel. The new strategy should, therefore, be primarily based on individual guidance to select innovative small tribal farmers. This would gradually pave the way for general community acceptance and group action.
- (v) To encourage farmers to install large number of pumps, 75 per cent of the total cost of pump installation should be given as subsidy. This is already in practice in Konta and Dantewada tehsils.
- (vi) The differential treatment between tribals and non-tribals has resulted in hidden opposition by the non-tribal farmers. To improve the utilization of irrigation potential, this disparity should be removed to the extent possible.
- (vii) It is essential to establish a feedback information system for a continual evaluation of the adoption of new agricultural technology and implementation of tribal sub-plans.
- (viii) Bastar is suitable for horticulture development. Efforts should, therefore, be made to supply grafted fruit plants and seeds of vegetable crops, and small nurseries at different farms may also be set up by the Government.
- (ix) Under soil conservation work, preference should be given to shape and improve lands under paddy cultivation. It is necessary to make provision for a subsidy of at least 50 per cent of the total cost to the tribal farmers so as to enable them to participate in the programme.
- (x) There is one regulated Krishi Upaj Mandi (KUM) at Jagdalpur. It is proposed in the sub-plan to strengthen this mandi by opening sub-mandies at Lohandiguda, Bastar and Bakawand in Jagdalpur tehsil; two KUM in Bijapur and Bhopalpatnam and one KUM at Geedam in Dantewade tehsil. It is also proposed to strengthen this mandi by opening sub-mandis at Tumnar and Kuakonda, and two KUM at Kondagaon and Keshkal blocks. There are also proposals

to open mandis at Baderajpur, Pharasgaon, Makdi, Antagarh and Pakhanjore, one KUM at Kanker and strengthening of sub-mandi at Sarona and one regulated KUM at Narayanpur. These proposals should be implemented without delays.

Animal Husbandry Programmes in Bastar

The quality of cattle population in the district is generally poor. The breed has to be improved which will result in improving the capital stocks of the tribal and secure better prices for the meat. Besides, they would earn more from the increased milk output. Presently of the 13 breeding units in different blocks of Bastar, only 4 are functioning. The defunct cattle breeding units in the district must be revived at any early date. It was proposed to establish 12 such units during the Fifth Plan period which should materialise atleast by 1980.

The key village scheme proposed to cover all aspects of cattle husbandry is making steady progress in Jagdalpur tehsil. It is necessary to spread the scheme to other tehsils. Also there is a scheme to supply cross breed Jersey cow on 50 per cent subsidy and 50 per cent loan basis which may be taken up during 1978-83 plan period.

The goat population in the district is generally of indigenous poor variety. Steps must be taken to castrate the local bucks. The cost of one improved buck will be Rs. 350 to 450 according to breed. The cost must be subsidised both for the tribal as well as non-tribal small farmers to make the scheme acceptable. Similarly schemes must be undertaken to upgrade the quality of birds in the district.

Piggery has not been exploited as an economic activity in the district. Pig being prolific breeder can multiply rapidly and give quick returns to investment. It is proposed that a special officer at the district level may look after the development of this industry so that it generates income among the poorer sections of the population.

Considering the fluctuating growth trends in the population of livestock and contagious cattle diseases it is necessary to provide adequate health facilities for the animals. At present there are 31 Veterinary Hospitals and 38 Veterinary Dispensaries in the district. It was proposed to establish 5 Veterinary Hospital and 18 Veterinary Dispensaries during the Fifth Plan period of which only a few have finally come up. The tribal farmers in the district are scattered and are not accustomed to visit the hospitals. It is, therefore, proposed that there should be door-to-door approach calling for at least another 35 Veterinary Dispensaries during the perspective plan period. The supply of medicines to all the veterinary institutions must also be increased considerably.

Most of the animals in the district suffer from malnutrition and pasture starvation specially during summer season. To popularize high yielding and nutritive fodder crop, it is necessary to conduct demonstration in

farmers' field. Fodder seeds and fertilizers should be supplied free of cost to the set of identified farmers. A select number of farmers need to be trained in matters of cultivation of green fodder in each block. The district has an immense availability of cowdung and other source of waste which can be used in gober gas plants. Looking at the size of the district, under such electrification programme it may be practical to cover the use of gober gas system instead of extending electrification within the next five years. It is, therefore, advisable to promote the lines to remote villages.

Agricultural Programmes in Chandrapur

Like Bastar, the development of agriculture in Chandrapur is primarily dependent on the expansion of irrigation facilities. There is no perennial irrigation in Chandrapur today. The area under perennial irrigation is likely to be 4,200 hectares after 5 years and 7,700 hectares after 10 years. The potential can be further increased through local initiative. The bulk of irrigated land is today essentially utilized for paddy. While rice will continue to have substantial share of total irrigation facility in 1982-83, it is expected that a significant portion will be used for other crops including wheat and sugarcane.

Several suggestions in case of Bastar in the preceding section are valid for Chandrapur as well. A few specific recommendations are given below.

- (i) Wherever possible, high yielding and low risk crops like paddy and wheat should receive priority under extension programme and in the provision of inputs.
- (ii) Efforts should be made to bring the maximum possible irrigated area under high yielding varieties. The latter should be given priority in the application of nitrogenic fertilizers.
- (iii) Sources of organic fertilizers should be developed to the extent possible. In this context the development of bio-gas referred to earlier becomes extremely important.
- (iv) It is proposed to increase the production of sugarcane in Wadsa in Gadchiroli tehsil based on the recent irrigation development. In addition it would be desirable to augment area under sugarcane in certain other regions with well drained medium soil, e.g., parts of Sironcha tehsil. This should occur together with the developments of khandsari units, the latter providing the demand support. The bulk of potato cultivation should take place in alluvial sandy loamy soil in the banks of the Wainganga, Godavari and Wardha rivers.

Animal Husbandary Programmes

The strategy for development of dairy industry in Chandrapur should be based on the following steps:

- (i) The provision of a market for liquid milk and useless cattle.
- (ii) The provision of extension advice and essential inputs on an efficient footing.
- (iii) An Animal Husbandry programme which will assist the farmer in upgrading his existing livestock through cross breeding.
- (iv) A general improvement in communication facilities which would enable an individual farmer to take advantage of marketing.

A statement showing the item-wise target is given below:

Item	Daily existing	Two years	At the end of	
			five years	ten years
Expansion of veterinary aid centres in total	25	35	75	120
No. of cows and buffaloes to be inseminated per annum	...	3,000	5,500	7,500
Capital investment for providing additional facilities for artificial insemination at veterinary aid centres (in '000 Rs.)	...	37.5	1,525	4,350

The development of Inland Fisheries Industry should be based on a four stage operation consisting of breeding, producing fish fry, rearing fish seed to fingerling size and finally releasing fingerlings into tanks and reservoirs where they are raised to adult marketable sizes. The target levels of production of fish after discussion with the concerned officials, are set as:

	1980-81	1982-83
Production of fish (tonnes)	1,600	4,800

Sixty per cent of the potential area for fish development in the district can be exploited within the perspective plan period yielding Rs. 1.9 crores of additional income per annum.

DEVELOPING INDUSTRIES IN THE DISTRICTS

The Sixth Five Year Plan has suggested that "Agricultural programme

and the plan for cottage and village industries development will be integrated into a comprehensive programme of integrated rural development." The perspective plan for Bastar and Chandrapur within which the industrial projectons for the rural areas have been made, dealt with the different sectors of the district economy in an integrated fashion. The growth rate of some of the agro-based industries was projected based on the agricultural output targets, etc. Evidently this would require preparation of detailed integrated plans at the block level. The blockwise breakdown of the projected industrial pattern has been discussed in the section below. Here we attempt to give indication of broad industrial groups that may come up in the two districts.

Industrial Programmes in Bastar

A major factor responsible for the under development of Bastar in that the district has not been declared a backward area and hence no special capital subsidy is provided for setting up industries here. Unless industrial atmosphere is created, which is possible only through direct state investment and planned intervention, no remarkable growth rate for the district economy can be achieved.

There are immense possibilities for establishing large and medium industries based on raw materials available within the district, viz., cement, paper and pulp, newspaper, writing paper, sal seed extraction, tanning extract, plywood seasoning and preservation, compressed and laminated boards, refractories, chip and particle boards, hard boards, etc. It has been observed in the past that a number of letter of indents/licences are issued by the Central Government for the district. However, only a small percentage of these come up within the district. Some of the industrial units that see the light, close down within a year of their establishment. It is felt that the Central Government and/or the State Government should break the ice by setting up some large scale undertakings in the public sector. Once these large and medium industries are established, the small scale industries technologically interlinked with the former would come up in the district.

The new industries in the district have been suggested on the basis of (i) available local resources and (ii) existing and anticipated demand for various industrial and consumer products in the district, and (iii) trading possibilities with the neighbouring districts.

*Agro-based Industries**: The district has got an agricultural base for establishing the following industries:

(i) *Cattle Feed and Poultry Feed*: Considering the upward trend of

*Location of some of these units has been suggested based on the report on 'Industrial Potential in Bastar' released by the concerned department in the district.

demand for this item, a unit may be set up either at Jagdalpur or Kanker.

- (ii) *Rice Bran Oil*: On the basis of rice bran available in the district, one unit can be set up with an extraction capacity of 10 MT rice bran per day. The unit will be either at Kanker or at Jagdalpur.
- (iii) *Activated Carbon*: Activated carbon is used in refining vegetable oil, glycerine, glucose, syrup and in pharmaceutical industries. At present there is no unit in Madhya Pradesh manufacturing this item. The main raw materials required for manufacturing this are paddy husk and saw dust which are available in plenty in this district. One unit of activated carbon may be set up at Jagdalpur.
- (iv) *Ragi Malt Food*: Ragi is cultivated extensively in the district and the demand for the malt food has been growing in the State. It is, therefore, suggested that two small scale units can be set up in this district to meet the growing demand. The suitable sites are Jagdalpur and Kanker.
- (v) *Straw Board*: Paddy husk is abundantly available in the district as raw material for straw board industry. In absence of any industry in the district, one unit may be set up at Jagdalpur.
- (vi) *Starch from Tamarind Seeds*: Starch manufactured from tamarind seeds is used for sizing purposes in textile mills. In Bastar tamarind is widely grown. It is, therefore, suggested that one unit can be set up in the district. The suitable location for this unit will be Geedam.
- (vii) *Wooden Bobbins*: Wooden bobbins are required by the textile mills and jute mills in the country. Haldu wood which is abundantly available in the district is most suitable for this purpose. On the basis of availability of raw material one unit can be set up at Kondagaon.
- (viii) *Wooden Planks and Wooden Cases*: With the industrial development, demand for packing cases is increasing very fast. Bastar is well endowed with soft wood which is suitable for packing goods and wooden planks. For the present, one unit may be set up at Jagdalpur.
- (ix) *Flush Doors*: The raw materials used for making flush doors are teak wood and sal that are available in plenty in the district. The development of large industrial projects at places like Raipur, Bhilai and Korba has created a good demand for setting up two units for manufacturing flush door at Kanker and Jagdalpur.
- (x) *Wood Seasoning Plant*: Seasoning of wood before use is necessary for efficient utilization of timber. There is a good market for seasoning wood in the country and the district offers scope for

number of such plants. The ideal places are Narayanpur, Geedam, Sukma, Bijapur and Jagdalpur.

- (xi) *Electrical Wooden Accessories:* As a result of constructional activities and the electrification programme in rural areas, the demand for electrical accessories has gone up in the State. Semi-hard wood is available abundantly in the forest of this district. One unit of this type can be set up for the present. The suitable location for the unit will be either Kondagaon or Jagdalpur. This unit can also take up manufacturing of photo-frames.
- (xii) *Bamboo Articles:* Bamboo is abundantly available in Bastar. The tribals are endowed with talents in the manufacture of a variety of bamboo articles. At present there is no organized unit for the manufacture of bamboo products. It is suggested that the Tribal Welfare Department can set up a few well organized units to help the Tribal Community. The unit can be promoted at Narayanpur, Sukma and Geedam.
- (xiii) *Pool Bahari Grooms:* Pool bahari grass is one of the minor forest products of the district. To utilize this raw material it is suggested to organize units in places like Kanker, Bhanupratappur, Narayanpur, Sukma and Dantewada where this type of grass is available.

Mineral Based Industries: There is a considerable scope for the development of certain mineral based industries like building bricks, roofing tiles (Mangalore tiles) and lime burning. For building bricks, suitable clay is available near Jagdalpur, Lohandiguda, Bastar, Kanker, Bhanupratappur, Geedam, Narayanpur, Bijapur, Bhopalpatnam and Konta. Field investigations reveal that with urbanisation, demand for bricks is growing up in the district. As such semi-automatic brick making units may be set up at above places. Similarly for roofing tiles, the locally available clay is quite suitable. The appropriate location for this unit is Jagdalpur. In view of the rich deposits of lime in the district, a few lime burning units may be proposed at Jagdalpur, Narayanpur, Kanker and Geedam.

Livestock Based Industries: Bone meal and sole leather tanning industries have good prospect in the district. Bone meal increases the productivity of soil and its demand is also sizable in the country. With the present availability of raw bones two small scale units can be set up at Jagdalpur and Kanker. Secondly, the total availability of hides from dead animals in this district is estimated at 1,30,000 nos. per annum. At present only 10 per cent of the available hides are utilized by village artisans and the rest are sent outside the district. The demand for sole leather has been growing very fast both within and outside the country. It is, therefore, suggested that to utilize the hides gainfully, three mechanized tanneries can be set up in the district at Geedam, Narayanpur and Sukma,

Industrial Programmes in Chandrapur

Based on the resources endowments of the district and the future pattern of demand the following industries may be recommended.

Mineral Based Industries: Based on the availability of iron-ore, coal, limestone, clay, barytes, sillimanite, quartz, mica and tale building stones, the following large scale industries may be recommended. It may be seen that similar pattern for large scale units has been proposed in the Eco-system plan of the district.

<i>Proposed industry</i>	<i>Source of major raw material</i>	<i>Proposed location</i>
Integrated steel	Iron ore of Surjagad, Gatta Wadvi and Bhamagad area	Machhilighat and river bank of Pranhita river.
Sponage iron project	A suitable deposit of Gatta Wadvi area	Machhilighat and river bank of Pranhita river.
Cement plant	Awarpur, Naokan area	Any location between Awarpur-Manikgad Railway Station
L.T.C. Plant	Rayatwari and Mahakali	West of Wariganga river
Coal-based fertilizer	Sasti—Ballarpur coal, field	West of Wariganga river
Coal mining	—	All the coal fields of the district

Forest Based Industries: There are a few forest-based industries of large and medium size in the district. The only landmark in this respect is the establishment of Ballarpur Paper Mills at Ballarpur. Except for a few outdated saw mills scattered here and there, modern forest based industries have not made a dent on the economic scene of Chandrapur although the scope for establishing such small industries based on the forest produce is tremendous.

(1) *Mohuwa Oil:* Mohuwa seed is rich in its oil content which should be collected in an organised way for extracting oil. Being a hard oil, it can be used in the soap industry. At least one unit may be located in the eastern part of the district, possible location being Gadchiroli.

(2) *Packing Cases, Bobbins, Decorative Articles including Photogrames, Laboratory Equipment and Mathematical Aid:* Salai, mowai, behada, haldu, and phetra woods are required for manufacturing these items in Chandrapur. Three units can be established in Ballarpur area.

(3) *Particle Board and Strawboard:* The type of raw material required for manufacturing these items is firewood and coarse grass that are in abundance in Chandrapur forests. Two units, one each at Waroda and

Aheri can easily come up.

(4) *Bidi Industry*: Steps should be taken to improve the tendu culture for starting a few bidi industries in the rural areas preferably in Sironcha and Gadchiroli taluks which will open new economic opportunities for the tribal people to supplement their income.

(5) *Agro Implements, Bullock Carts and Hubs*: Teak, ain, tinsa, khair and dhawda are some of the locally available woods which could be used for manufacturing various agricultural implements. Besides, tool handles, door and window frames, electrical cappings and casings, can also be manufactured out of these woods. The obvious locations for these units are Chandrapur and Ballarpur. The area being rich in agriculture and with the proposed high rate of growth during the perspective plan these industries hold out good promise.

Agriculture and Animal Husbandry Based Industries

(1) *Rice Bran Oil*: Paddy is the most important food crop of the western part of the district. Rice bran, a by-product, has not so far been put to any industrial purpose. Two rice bran plants of 5-tonne capacity per day with an estimated capital of Rs. 12 lakhs each in cooperative sectors can be set up in the district.

(2) *Bone Meal*: The livestock and wild animal wealth of Chandrapur is quite sizable. The dry bones of the animals can be used for manufacturing bone meal. There is scope for starting at least one unit at Rajura.

Resource Based Industries

(1) *Aluminium and Copper Ballasts and Chokes for Neon Tubes*: Two units can be proposed at Nagbhid to manufacture these items.

(2) *Pulverisation of Calcite*: There are two low-grade deposits of calcite near Ghugus. The calcite after pulverisation is used as a raw material in pigment industry. Both yellow and red ochres are found in sizable quantities which can be used in the paint industry. These deposits can meet the requirement of one pulverising unit with possible location at Chandrapur.

(3) *Sodium Silicate*: Considerable quantity of quartz crystals in the purest form is found near Ghot, Mul and Sindewahi. Fine sand used in the foundry can be manufactured out of these crystals. These can also be used in the manufacture of silicate of soda which is the main raw material for glass and several chemical industries. Presently, the only glass unit at Chandrapur is purchasing its requirement from Allahabad and Hyderabad. Thus, there is good scope for starting a unit for sodium silicate either at Chandrapur, Mul or Sindewahi.

(4) *Barbed Wire and Nails*: Two small units can come up at Rajura or Nagbhid.

(5) *Ceramic Industry*: Four to five units to manufacture stoneware,

refractory, porcelain electric insulator, domestic crockery, etc., can be started at Bhandak which is on the Delhi-Madras broad gauge section.

(6) *Fire Bricks*: The capacity of any economical unit to manufacture fire bricks would be about 2,500 bricks per day involving a capital outlay of about Rs. 10 lakhs using modern mechanical process. Both training facilities and cheap labour are available in the district.

The following industries may also be considered for setting up at Bhandak in the district:

1. Hume pipes (cement, reinforced cement pipes, etc.);
2. Paints, varnish and enamel;
3. Laundry soap;
4. Automobile parts and accessories; and
5. Builders' hardware.

PROVISION OF ECONOMIC INFRASTRUCTURE AND OTHER SOCIAL FACILITIES

It is proposed that all future industries would be located at different growth foci listed in Appendices 6.1 and 6.2 (also see Figs. 6.1 and 6.2). Growth Centres will be the consumers of finished and semi-finished products produced at the Growth Points, while finished goods would move in the reverse direction. The Growth Centres in Bastar and Chandrapur districts will be marked by a preponderance of secondary activities although the percentage is bound to be smaller compared to the Growth Centres in developed districts. Next in order of importance will be tertiary activities whose nature will depend the economic structure of the sub-region they serve. Some of these Growth Centres will have banking facilities, graduate and post graduate institutions, technical institutions and servicing facilities apart from those facilities that are possessed by other lower order centres. It will be connected by pucca road with the neighbouring Growth Points.

Growth Points will be, in general, medium order settlements having their own economic and social base. These will be predominantly agro-industrial. The Growth Points will have facilities like police station, extension service centre, post & telegraph office, banks, a permanent marketing place, warehousing, a junior college, government as well as private centres handling agricultural inputs especially fertilizers, pesticides and machines and repair shops. However, no specific location may have all of these facilities. These will be connected by pucca roads with all the Market Centres in the neighbourhood. On the other hand, Market Centres will be the wholesale collection and distribution centres for the area. It will have some sort of a 'small agro-industrial estate' to absorb the increased agricultural output of the surrounding area and to provide the necessary inputs.

Service Centres will be accessible to every village within a distance of

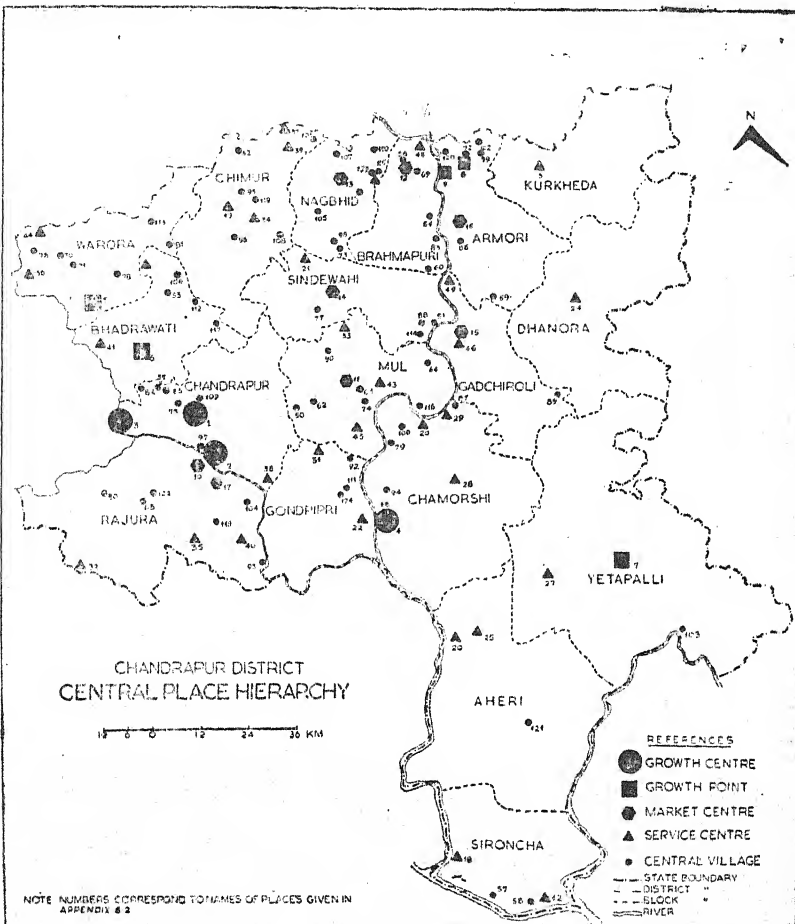


FIG. 6.2

level of services: a middle school, a multipurpose cooperative society and a dispensary.

THE BLOCK LEVEL PICTURE

For an effective implementation of a district plan, it is necessary to have a breakdown of the sectoral targets among different blocks. An attempt has been made in this section to project the number of pump sets, industrial units, connections for domestic/commercial use and street lighting for the different blocks in the two districts (Table 6.2 and 6.3). The method for making the block level projections is discussed in the following pages.

TABLE 6.2 BLOCKWISE DISTRIBUTION OF PROJECTED CONNECTIONS AND LOAD IN BASTAR, 1982-83

Sl. No.	Name of block	No. of electrified villages (1977-78)	Proposed No. of villages to be electrified	No. of Growth Foci	Agricultural pump sets		L.T. Industries		Domestic/Commercial		Street-lighting	
					No.	CL (HP)	No.	CL (KW)	No.	CL (KW)	No.	CL (KW)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.	Jagdalpur	31	14	4	480	2,648	27	411	914	433	185	7.6
2.	Bastar	29	40	9	587	3,239	24	353	1,198	515	212	8.6
3.	Bakawand	10	41	4	341	1,881	8	118	759	288	112	4.6
4.	Tokapal	13	19	5	268	1,479	12	176	550	234	97	4.0
5.	Lohandiguda	14	8	3	225	1,241	7	88	434	202	86	3.6
6.	Darbha	—	19	2	97	535	4	59	242	77	28	1.1
7.	Bastanar	1	21	2	121	668	5	79	292	98	35	1.4
8.	Dantewada	8	34	8	279	1,539	27	371	623	236	92	4.3
9.	Geedam	6	26	2	212	1,170	9	98	473	178	70	2.8
10.	Kuakonda	6	25	3	207	1,142	14	88	461	174	68	2.7
11.	Katekalyan	—	19	1	97	537	2	29	242	77	28	1.1
12.	Chhindgarh	2	49	4	277	1,528	9	132	671	224	83	3.1
13.	Sukma	6	22	2	192	1,059	5	70	422	162	64	2.6
14.	Konta	6	12	3	141	778	8	95	295	121	49	2.0
15.	Bijapur	1	21	3	121	668	6	88	292	98	35	1.4
16.	Bhairnagarh	—	9	1	46	254	2	29	115	37	13	0.5
17.	Bhopalpatnam	—	10	3	51	281	6	89	127	41	14	0.6

18. Usoor	—	10	3	51	281	7	103	127	41	14	0.6
19. Bade Rajpur	—	21	2	108	596	4	59	268	86	30	1.2
20. Kondagaon	13	15	4	248	1,368	36	484	499	218	91	3.8
21. Keshkal	2	21	3	134	739	13	143	315	110	41	1.6
22. Makdi	—	28	2	144	795	4	59	357	114	41	1.6
23. Pharagaon	—	28	2	144	795	4	51	357	114	41	1.6
24. Narayanpur	8	23	4	233	1,230	20	232	483	191	76	3.1
25. Antagarh	—	24	2	123	679	4	59	306	98	35	1.4
26. Koilibeda	—	30	5	154	850	12	176	382	122	43	1.7
17. Abujhmar	—	1	2	5	28	4	59	13	4	1	0.1
28. Kanker	29	19	6	479	2,642	21	288	930	429	182	7.5
29. Charama	16	51	8	471	2,598	32	359	1,030	402	159	6.5
30. Sarona	12	56	7	446	2,461	17	238	998	373	145	5.8
31. Bhanupratappur	8	37	4	293	1,617	21	288	661	248	97	3.9
32. Durgakondal	3	19	1	136	750	3	51	313	114	43	1.8
District	224	772	114	6,901	38,076	379	5,030	15,151	5,858	2,310	94.2

TABLE 6.3 BLOCKWISE DISTRIBUTION OF PROJECTED CONNECTIONS AND LOAD IN CHANDRARUR, 1982-83

Sl. No.	Name of block	No. of electrified villages (1977-78)	Proposed No. of villages to be electrified	No. of Growth Foci	Agricultural pumps sets		L.T. Industries		Domestic/Commercial		Street lighting	
					No.	CL (HP)	No.	CL (KW)	No.	CL (KW)	No.	CL (KW)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.	Chandrapur	53	13	10	905	4,151	209	3,229	1,590	601	637	36.9
2.	Mul	48	38	11	1,020	4,679	188	2,904	1,986	740	741	45.0
3.	Gondpipri	41	87	5	1,286	5,899	83	1,282	2,831	1,041	977	62.5
4.	Brahmapuri	53	19	7	951	4,362	126	1,946	1,715	645	674	39.6
5.	Nagbhid	64	31	11	1,209	5,546	174	2,688	2,239	840	865	51.4
6.	Sindewahi	40	51	9	997	4,573	149	2,302	2,057	762	740	46.0
7.	Sironcha	35	16	4	654	3,000	44	680	1,205	452	467	27.7
8.	Aheri	14	38	3	503	2,307	39	602	1,139	417	385	25.0
9.	Yetapalli	—	42	2	320	1,468	18	278	874	315	265	18.5
10.	Gadchiroli	22	26	5	532	2,440	85	1,313	1,089	404	394	24.4
11.	Armori	34	15	8	631	2,894	130	2,008	1,160	435	452	26.6
12.	Dhanora	3	25	1	237	1,087	14	216	595	215	190	12.8
13.	Chamorshi	11	91	10	860	3,945	120	1,854	2,167	785	688	46.6
14.	Kurkheda	14	33	1	464	2,128	27	417	1,035	380	354	22.7
15.	Warora	78	57	9	1,620	7,432	94	1,452	3,129	1,168	1,175	71.0
16.	Chimur	37	76	9	1,141	5,234	111	1,715	2,503	921	867	55.3
17.	Bhadrawati	20	59	7	845	3,876	77	1,189	1,875	690	645	41.4
18.	Rajura	54	76	11	1,400	6,422	177	2,734	2,925	1,082	1,041	65.4
	District	627	793	123	15,575	71,443	1,865	28,810	32,114	11,893	11,557	718.8

Agriculture

On the basis of the development potential, index computed at the block level and number of target villages (un electrified villages with 200 population or more), an estimate of the number of villages for electrification has been made. Now we have two norms for the number of agricultural connections per village: one for the villages electrified before 1977-78 and the other for those to be electrified during 1979-83. Assuming these two to be invariant over the blocks, an estimate of the number of connections in the old and new villages has been made. This when multiplied by the average connected load norm, gave the connected load figures for different blocks.

Industries

The total number of industrial connections coming up during the perspective plan period in the two districts has been obtained as discussed in the preceding chapter. This total was allocated among the blocks proportional to the number of Growth Centres. We also had the number of industrial connections existing during 1977-78. The two added together gave the block level figure for total connections for 1982-83. Two sets of norms were computed for average connected load per industrial connection for the two districts, separately. First norm corresponds to the new industrial units and this is a weighted average of the connected load of the projected industries. Second norm is for the old industries computed from the past data. These norms were multiplied by the number of new and old industrial units and added to give the block level connected load figures.

Domestic/Commercial and Street Lighting

Projections for these two different types of consumption, i.e., domestic/commercial and street lighting have been made following an identical methodology. First, the block level figures for electrified villages both existing and proposed were obtained. Here, too, there were two sets of norms for connected load per connection. These two when multiplied by the corresponding figures of number of villages, gave the estimates for connected load at the block level.

PHASING OF THE TOTAL COST FOR RURAL ELECTRIFICATION

To get an estimate of the cost of taking electricity to villages, past data on total cost were analysed for the two districts separately. The schemes submitted to the REC for loan disbursement were considered for this purpose. The total cost of the project and the corresponding number of electrified villages in the scheme areas were aggregated to get the district level picture. While the total of the number of villages in different schemes were simply added to get the district total, price indices were used to bring the cost

figure to a common denominator. In fact all the costs were scaled up to reflect the 1977-78 prices. The cost figures, thus, obtained were divided by the total number of villages to give the average cost of electrification. For Chandrapur the figure comes to 70,000 whereas in case of Bastar with its rugged terrain and low density of population per village, the cost works out to be much higher, i.e., Rs. 82,000.

It was considered necessary at the first stage to adjust the cost estimate for projection purposes to take account of the future structural changes in the economy. Our discussion with the experts in the field suggested that the future cost may be lower by 10 per cent or so because of the economies of scale and other developmental benefits in the region. This, however, is likely to be offset by the fact that during the Sixth Plan period, areas with lower density of population or villages are to be covered. The density of villages in the proposed areas for electrification works out to be approximately 10 per cent lower than that of the earlier areas. In the absence of adequate data to analyse the structural changes, external economies, etc., to occur in future and also due to lack of knowledge regarding the cost implication for electrifying smaller and remote villages, it has been decided to take the past data as a guide for future projections. By multiplying the average cost figure to the number of villages to be electrified in different years, a time phasing of the total cost has been obtained as presented in Table 6.4. It may be noted that although the number of villages to be electrified in Chandrapur is larger than that of Bastar, the cost is lower by about 12 per cent.

TABLE 6.4 COSTS OF RURAL ELECTRIFICATION IN BASTAR AND CHANDRAPUR

Years	Bastar		Chandrapur	
	No. of villages to be electrified	Cost (Rs. in '000)	No. of villages to be electrified	Cost (Rs. in '000)
(1)	(2)	(3)	(4)	(5)
1978-79	108	8,856	111	7,770
1979-80	127	10,414	131	9,170
1980-81	150	12,300	155	10,850
1981-82	178	14,596	182	12,740
1982-83	209	17,138	214	14,980
Total	772	63,304	793	55,510

PROVISION OF INSTITUTIONAL CREDIT

Implementation of the perspective plan in the two districts would require investment both in the public as well as private sector. It is evident that the proposed number of pump sets, *i.e.*, 6,273 for Bastar and 12,080 for Chandrapur would require investment by the farmers to a large extent. Similar investments are called for to achieve the proposed rate of industrial growth. While one can expect some amount of additional savings being generated, the rate cannot be taken to be more than 20 per cent given the high propensity of consumption in the two districts. This implies that about 70 to 80 per cent of the total investible resources may have to be initially provided through organized financial institutions. Similarly, for the industrial sector, 60 per cent of the resources may have to come from the banking institutions.

Present network of commercial and cooperative banks in the two districts seems to be adequate to take up this responsibility of disbursing required amount of credit. Most of the commercial banks have already expanded or proposed expansion schemes during the perspective plan period. Besides, the policy of the State Bank as well as some other commercial banks has been to upgrade their sub-offices through providing more staff and other facilities. The State Bank of India and the Bank of India, the lead banks for the two districts, Bastar and Chandrapur respectively have taken a number of steps to meet the growing demand for banking services. They are also contemplating opening of agricultural developmental branches, etc., through suitable arrangement with cooperative institutions and other banks. It thus appears that the existing network if properly strengthened with staff and other facilities, would be in a position to meet the credit demand for the initial years of the perspective plan. For the subsequent years expansion would be required which has been incorporated to a great extent in their credit plans.

The existing level of credit disbursed by these institutions is, however, miserably low. This is reflected in the poor advance-deposit ratio for both the districts. It has been suggested in Chapter 3 that there is a systematic transfer of resources from this region to others through the banking institutions. This process must stop and the banks must play a positive role if the perspective plan has to be implemented. It can easily be seen that given the present level of deposits in these districts, it should be possible to meet the additional credit requirement largely through the internal resources.

THE REC NORMS ON RATES OF RETURN

REC sanctions schemes of different types depending upon the level of development of a region as has been discussed in Chapter 4. The period of loan repayment varies among different type of the schemes, the

backward regions being allowed a larger time period. The rate of return expected in different regions, however, happens to be the same in all categories of districts. Even if the present level of disparities are ignored and only the regional heterogeneity in terms of physical factors is considered, this policy can be immediately criticised. It has been mentioned above that Bastar has a rugged terrain which increases the cost of providing transmission lines. Besides, there are adverse factors due to remoteness of the region from the main transmission lines which also increase the cost in both the districts. Thirdly, the density of population as well as the density of villages per sq. kilometer is much lower compared to the respective State or the all India figure. Not only are the villages sparsely distributed in space, their average size is much smaller. These would inevitably increase the average cost of electrifying a village or a household.

It can be argued that these physical handicaps are, more or less, of a permanent nature, and these are not likely to be changed in the next 30 years. Besides, there are the constraints of a tribal economy which would restrict its growth for sometime to come. This would imply that the need for relaxation of norms in case of Konta and Dantewada schemes may be cited in support of the argument. The REC sanctioned for this project Rs. 79.21 lakhs. Of this Rs. 52.71 lakhs were subsidised by the State Government and the Tribal Development Agency, Dantewada and Konta. The returns of this were, therefore, calculated on a capital base of Rs. 26.50 lakhs which is the difference between the amount sanctioned and the subsidy. Despite this low capital base and the incentives for pumps given in the project area, the returns have not come up to the norms set for normal LIS and ND pumps. Also the project is not the one badly implemented or mismanaged. It, therefore, becomes amply clear that marginal relaxation to the farmer would not solve the financing problems. It is proposed that the norms of LIS pumps should be revised up from the present Rs. 600 per HP to Rs. 1,500 per HP. Any programme should be proposed assuming that these norms would increase and the share of the State Government for all REC schemes be forthcoming.

PROVISION OF SUBSIDY

Tribals are entitled to 75 per cent of the total cost of installation of a pump as subsidy in TDA areas of Dantewada and Konta. In the other areas of this district, the subsidy is 50 per cent of the cost. The economics of this subsidy for non-TDA areas need to be examined. For installing a 5 HP pump set the cultivator has to spend Rs. 10,000 for the well, Rs. 4,000 for the pump, Rs. 3,000 for the pump house and other accessories. As against this, the subsidy entitlement is Rs. 2,000 for the pump and Rs. 2,500 for the well; while a loan is available from the Land Development Bank at an interest rate of 11 per cent. In addition to the cost, the farmer has to

obtain 'no dues certificate' from 4 to 5 agencies and contact AEO, Patwari, MPEB officers, LDB, COB, Tehsil office, Electricity Inspector, DMO, etc. In the process of 'contacting' these functionaries, he spends on an average an amount of Rs. 1,000. The pump now must give him a return of 2,800 in the second year so that he can start paying back his instalments and interest to the Land Development Bank. The soils in the district being undeveloped and undulating, the cultivator is only able to irrigate an area of three acres. Besides, he has to spend a very large amount, often to the extent of Rs. 2,000 per acre for fencing. Obviously, such returns are rare and the entire programme gets a set back. If the programme has to be a success, the subsidy entitlement will have to be increased substantially and the process of getting a pump set will have to be simplified. This has already been done in the TDA of Konta and Dantewada where the project runs its own marketing society which supplies pump sets, etc. By virtue of the Project Officer of the TDA and the SDO having statutory control on the cooperative organizations, a tribal farmer has to contact a far smaller number of agencies to get a pump set. Besides, the non-tribal cultivators; who are entitled to smaller amounts of subsidy under the SFDA and MFAL programmes, may be treated on an equal footing.

These districts need concessional treatment not only with respect to the period of repayment but also with regard to the rate of return. Allowing a longer gestation period for a backward region assumes that the backwardness is a temporary phenomenon and the region will come up at the level of other regions in a short period of 10 to 15 years. An analysis of economy of the two districts have shown that it may not be possible to remove the factors of backwardness within the next two decades. It would, therefore, be necessary to bring down the rate of return below the normal rate for these regions at least by 30 per cent. This would ensure reasonable number of SEB projects sanctioned for these regions and utilization of developmental potential which would ultimately help in relaxing the long-term constraints.

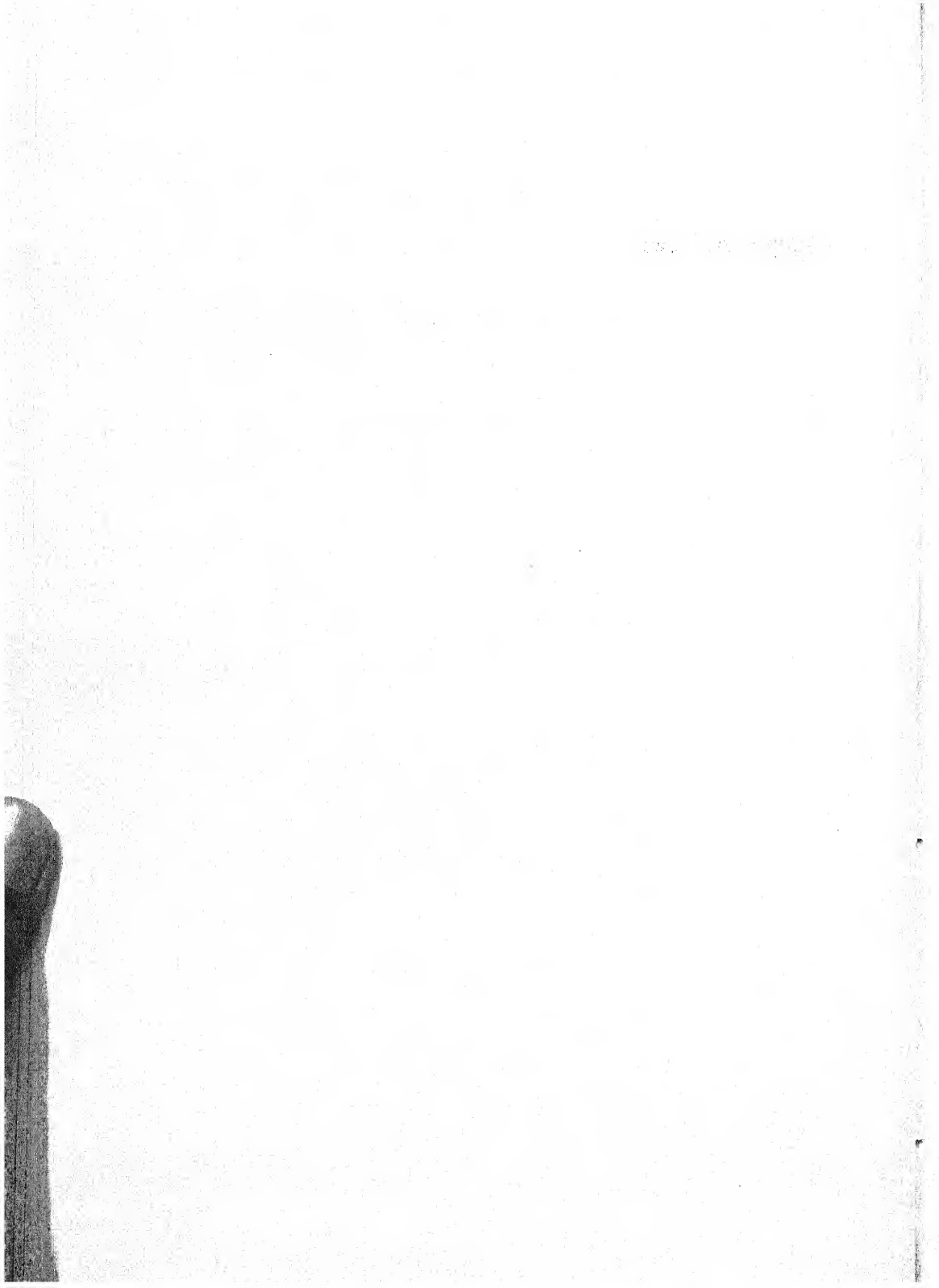
PROPOSED PATTERN OF REC SCHEMES

It may be observed that the district Bastar has been sanctioned both SU and MNP (T) schemes so far. Chandrapur, on the other hand, has OB and SU schemes. It is worth noting that during the Fifth Five Year Plan period the district Bastar has got schemes largely under MNP. This seems to be the right policy as far as this district is concerned. In view of the special backwardness and the low paying capacity of the district, it would be appropriate to extend the special concession of the RMNP to the district for atleast next five years. The tribal population in the district has been denied the basic necessities of life for long. They continue to suffer at the hands of few landlords, money lenders and traders, majority of which

are non-tribals and the existing government machinery can hardly provide any protection. It should, therefore, be considered as of utmost importance to provide basic economic infrastructure in terms of electricity and others, independent of whether the region has paying capacity in the immediate future or not.

Chandrapur, on the other hand, has a mix of OB and SU schemes as has been indicated in Chapter 4. The district is not covered under MNP programme. In view of the level of electrification of the district and also its present level of industrialization and agricultural development, it is not possible to plead the case of Chandrapur being covered under MNP. However, one can suggest that parts of the district namely, Gadchiroli, Sironcha and Rajura tehsils and the adjoining places be covered only under SU schemes. This implies that overtakes the ratio of SU to OB schemes should increase.

Appendices



Appendix 1.1

GROWTH IN SEX RATIO (FEMALES PER 1,000 MALES)

	Sex ratio rural		Sex ratio urban	
	1961	1971	1961	1971
(1)	(2)	(3)	(4)	(5)
India	963	949	845	858
Madhya Pradesh	970	956	856	868
Bastar	1,007	1,003	903	846
Maharashtra	995	985	801	820
Chandrapur	993	981	901	878

*Appendix 2.1*TEHSILWISE NUMBER OF HOUSEHOLDS AND NUMBER OF OCCUPIED
RESIDENTIAL HOUSES IN BASTAR, 1961-71

<i>Name of tehsil</i>	<i>No. of occupied resi- dential houses</i>		<i>No. of households</i>		<i>No. of households per 100 residential houses</i>	
	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jagdalpur						
1961	57,686	4,511	58,505	4,705	101.42	104.30
1971	63,953	7,275	70,361	8,255	110.02	113.47
Dantewada						
1961	22,181	—	21,235	—	120.25	—
1971	26,875	1,849	28,116	2,492	104.62	134.78
Konta						
1961	19,873	—	20,253	—	101.91	—
1971	23,566	—	23,855	—	101.23	—
Bijapur						
1961	16,533	—	16,849	—	101.91	—
1971	20,653	—	21,333	—	103.29	—
Kondagaon						
1961	32,530	—	32,824	—	100.90	—
1971	41,080	—	42,471	—	103.39	—
Narayanpur						
1961	16,478	—	16,553	—	100.46	—
1971	28,206	—	29,569	—	104.83	—
Kanker						
1961	27,986	1,414	28,820	1,435	102.98	101.49
1971	29,158	2,105	32,812	2,224	112.53	105.65
Bhanupratappur						
1961	10,478	—	10,507	—	100.28	—
1971	11,431	—	11,925	—	104.32	—
District						
1961	2,02,745	5,925	2,05,546	6,140	101.38	103.63
1971	2,44,922	11,229	2,60,442	12,971	106.34	115.51

Appendix 2.2

TEHSIL/BLOCKWISE AREA AND POPULATION IN BASTAR

<i>Sl. No.</i>	<i>Name of tehsil/ block</i>	<i>Area in sq km (excluding forest according to village records)</i>	<i>Total population</i>	<i>Percentage of scheduled castes to total population</i>	<i>Percentage of scheduled tribes to total population</i>
(1)	(2)	(3)	(4)	(5)	(6)
	Jagdalpur	4,091	4,22,380	2.42	65.66
1.	Jagdalpur	565	92,553	1.76	42.12
2.	Bastar	796	81,067	7.27	64.84
3.	Bakawand	655	74,251	2.03	62.06
4.	Tokapal	385	43,922	0.37	72.72
5.	Lohandiguda	636	48,093	1.32	74.65
6.	Darbha	526	45,476	0.56	82.34
7.	Bastanar	504	37,018	0.33	92.98
	Dantewada	2,203	1,72,174	2.03	73.75
8.	Dantewada	590	50,013	2.36	63.52
9.	Geedam	613	43,477	2.14	85.13
10.	Kuakonda	293	46,368	2.31	61.22
11.	Katekalyan	707	32,316	0.97	92.21
	Konta	1,715	1,32,151	2.38	85.15
12.	Chhindgarh	518	47,316	2.38	80.43
13.	Sukma	476	38,295	3.70	82.63
14.	Konta	891	46,540	1.30	92.03
	Bijapur	3,697	1,17,650	3.92	79.54
15.	Bijapur	954	32,380	5.47	81.44
16.	Bhairamgarh	1,132	36,018	0.69	77.04
17.	Bhopalpatnam	842	26,830	7.23	75.99
18.	Usoor	769	22,422	2.93	85.09
	Kondagaon	3,681	2,48,242	4.17	69.88
19.	Baderajpur	255	40,966	3.46	73.74
20.	Kondagaon	1,825	83,520	6.33	64.24
21.	Keshkal	603	42,812	2.92	73.02
22.	Makdi	294	37,249	2.39	73.79
23.	Pharasaon	704	43,695	3.48	70.64
	Narayanpur	3,026	1,62,529	2.51	56.67
24.	Narayanpur	582	43,210	3.04	73.58
25.	Antagarh	665	36,350	4.75	77.62

Continued

(1)	(2)	(3)	(4)	(5)	(6)
26.	Koilibeda	725	74,395	1.37	29.46
27.	Abujhmar	1,053	10,583	0.21	96.29
Kanker		1,751	1,86,126	4.25	56.92
28.	Kanker	1,080	59,418	4.12	55.64
29.	Charama	393	59,495	4.71	48.11
30.	Sarona	278	67,213	3.97	65.86
Bhanupratappur		1,372	74,704	6.25	72.43
31.	Bhanupratappur	726	42,388	6.40	68.67
32.	Durgakondal	646	32,316	6.05	77.35
District		39,060	15,15,956	3.20	68.20

Appendix 2.3

**TEHSIL/BLOCKWISE DISTRIBUTION OF VILLAGES BY SIZE OF
POPULATION IN BASTAR, 1971**

Sl. No.	Name of tehsil/block	Total no. of inhabited villages	Average size of villages	Percentage of villages with population			
				Less than 500	500-1000	2000-5999	6000 and above
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Jagdalpur	570	741	51.40	29.30	3.16	0.18
1.	Jagdalpur	111	834	62.16	25.23	2.70	—
2.	Bastar	110	737	39.09	38.18	0.91	—
3.	Bakawand	99	750	40.40	33.33	2.02	—
4.	Tokapal	70	627	47.14	35.71	2.86	—
5.	Lohandiguda	79	609	54.43	27.85	2.53	—
6.	Darbha	59	781	66.10	16.95	3.39	1.27
7.	Bastanar	42	881	61.90	16.67	14.29	—
	Dantewada	233	739	48.93	27.47	5.38	0.43
8.	Dantewada	64	771	45.31	28.13	7.81	—
9.	Geedam	72	604	55.56	26.39	4.17	—
10.	Kuakonda	54	859	51.85	24.07	7.41	1.85
11.	Katekalyan	43	752	39.53	32.56	2.33	—
	Konta	317	417	70.98	20.82	1.26	—
12.	Chhindgarh	77	614	44.16	41.56	1.30	—

Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
13.	Sukma	54	709	50.00	29.63	5.56	—
14.	Konta	186	250	88.17	9.68	—	—
	Bijapur	518	227	90.54	7.14	0.58	—
15.	Bijapur	87	372	79.31	14.94	2.30	—
16.	Bhairamgarh	209	172	95.22	3.83	—	—
17.	Bhopalpatnam	127	211	91.34	6.30	0.79	—
18.	Usoor	95	236	89.47	8.42	—	—
	Kondagaon	531	467	71.75	20.72	1.69	0.18
19.	Baderajpur	56	732	46.43	35.71	1.79	—
20.	Kondagaon	171	488	75.44	16.37	1.75	0.58
21.	Keshkal	104	412	75.96	18.27	3.85	—
22.	Makdi	97	384	74.23	23.71	—	—
23.	Pharasgaon	103	424	72.82	19.42	0.97	—
	Narayanpur	626	259	89.62	5.27	0.96	0.16
24.	Narayanpur	165	262	93.33	4.85	—	0.66
25.	Antagarhi	150	242	96.00	2.67	0.67	—
26.	Koilibeda	153	486	68.63	13.73	3.73	—
27.	Abujhmar	158	68	100.00	—	—	—
	Kanker	318	820	46.23	38.68	0.31	0.31
28.	Kanker	104	571	60.58	30.77	—	—
29.	Charama	98	607	43.88	45.92	1.02	1.02
30.	Sarona	116	579	46.55	39.66	—	—
	Bhanupratappur	252	296	83.33	12.30	—	—
31.	Bhanupratappur	111	382	54.05	20.72	—	—
32.	Durgakondal	141	229	93.62	5.67	—	—
District		3,365	450	71.92	18.75	1.60	0.15

TEHSILWISE OCCUPATIONAL

<i>District/tehsil</i>	<i>Total population</i>	<i>Total workers (%)</i>	<i>Cultivators (%)</i>	<i>Agricultural labourers (%)</i>	<i>Livestock, forestry, fishing, hunting and plantation etc., (%)</i>
(1)	(2)	(3)	(4)	(5)	(6)
Bastar District					
1961	11,67,501	60.57	76.29	13.51	2.51
1971	15,15,956	36.69	67.08	22.13	1.21
Jagdalpur					
1961	3,43,051	61.32	72.85	15.24	2.05
1971	4,22,380	36.29	61.30	26.81	1.42
Dantewada					
1961	1,34,148	59.63	82.37	8.42	4.02
1971	41,72,174	43.32	72.55	9.17	1.49
Konta					
1961	1,08,549	59.71	75.14	11.64	7.39
1971	1,32,151	36.41	78.85	14.74	4.64
Bijapur					
1961	93,668	62.37	73.74	18.05	2.05
1971	1,17,650	36.94	73.94	20.22	1.26
Kondagaon					
1961	1,86,745	58.44	81.07	10.29	1.47
1971	2,48,242	33.38	72.52	17.99	1.13
Narayanpur					
1961	91,260	58.05	79.87	11.30	1.10
1971	1,62,529	34.58	69.94	21.50	1.48
Kanker					
1961	1,51,329	61.83	70.90	18.54	1.36
1971	1,86,126	42.21	54.81	35.86	0.93
Bhanupratappur					
1961	58,751	64.49	82.32	10.87	2.09
1971	74,404	25.64	65.24	21.53	0.87

NOTE: In 1961 Census both livestock, forestry, etc., and mining and quarrying were

2.4

PATTERN IN BASTAR 1961-71

<i>Mining and quarrying (%)</i>	<i>Manufacturing, processing, servicing and repairs</i>		<i>Construc- tion (%)</i>	<i>Trade and commerce (%)</i>	<i>Transport, storage and com- munication (%)</i>	<i>Other services (%)</i>
	<i>House- hold industry (%)</i>	<i>Other than house- hold industry (%)</i>				
(7)	(8)	(9)	(10)	(11)	(12)	(13)
	2.86	0.48	0.53	0.74	0.14	2.94
1.21	2.26	0.59	0.46	1.39	0.56	3.13
	3.60	0.82	0.30	0.99	0.25	3.90
0.04	2.12	0.98	0.54	1.84	0.83	4.12
	2.37	0.43	0.29	0.44	0.04	1.63
7.98	1.35	0.71	1.13	1.50	1.50	2.63
	2.01	0.26	0.83	0.44	0.06	2.22
0.01	1.68	0.32	0.28	0.91	0.09	2.67
	1.28	0.05	0.15	0.50	0.03	4.16
0.00	1.14	0.19	0.28	0.69	0.09	2.18
	3.90	0.21	0.19	0.71	0.13	2.01
0.00	3.83	0.41	0.17	1.28	0.03	2.33
	2.66	0.19	1.09	0.38	0.14	3.26
0.01	1.75	0.32	0.38	1.10	0.26	3.26
	2.71	0.82	1.47	1.10	0.11	2.79
0.04	3.15	0.52	0.16	1.31	0.23	2.98
	1.34	0.11	0.30	0.56	0.11	2.30
3.56	1.98	0.31	0.26	1.79	0.15	4.29

treated as one category.

LITERACY AND OCCUPATIONAL PATTERN OF SCHEDULED TRIBES
BASTAR AND

	<i>Literacy</i>	<i>Workers</i>	<i>Cultivators</i>	<i>Agricu- tural labourers</i>	<i>Livestock</i>	<i>Mining</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
India	R 10.68	1,41,66,062 (38.58)	83,70,941 (33.38)	47,27,969 (33.38)	3,30,782 (2.34)	65,783 (0.46)
	U 28.84	4,58,379 (35.41)	47,550 (10.37)	1,04,458 (22.79)	13,186 (2.88)	23,481 (5.12)
Madhya Pradesh	R 7.39	37,79,826 (39.78)	20,66,057 (62.99)	10,93,397 (33.33)	31,202 (0.95)	9,244 (0.28)
	U 21.12	54,094 (37.74)	6,173 (11.41)	15,214 (28.13)	1,255 (2.38)	7,311 (13.52)
Bastar	R 4.12	3,85,822 (37.52)	3,03,447 (78.64)	72,771 (18.86)	1,987 (0.52)	540 (0.14)
	U 25.30	1,808 (32.42)	217 (12.00)	379 (20.96)	55 (3.04)	232 (12.83)
Maharashtra	R 11.11	13,13,901 (46.49)	5,59,540 (52.59)	6,89,356 (52.47)	21,834 (1.66)	764 (0.06)
	U 25.61	49,892 (38.89)	1,594 (3.19)	18,486 (37.05)	3,243 (6.50)	480 (0.96)
Chandrapur	R 4.50	1,06,715 (46.39)	64,959 (60.67)	36,592 (34.29)	1,709 (1.60)	28 (.03)
	U 22.56	536 (40.06)	50 (9.29)	119 (22.12)	34 (6.32)	3 (0.55)

2.5

POPULATION IN INDIA, MADHYA PRADESH, MAHARASHTRA,
CHANDRAPUR

Manufacturing		Construc- tion	Trade and commerce	Transport	Others services
House- hold	Other than household				
(8)	(9)	(10)	(11)	(12)	(13)
1,39,521	97,055	36,601	56,303	43,626	2,97,481
(0.98)	(0.69)	(0.26)	(0.40)	(0.31)	(2.10)
10,965	65,077	22,710	31,095	40,722	99,135
(2.39)	(14.20)	(4.95)	(6.78)	(8.88)	(21.63)
24,781	9,256	5,901	5,255	3,313	31,420
(0.76)	(0.28)	(0.18)	(0.16)	(0.10)	(0.96)
927	4,582	1,480	1,988	3,760	11,374
(1.71)	(8.47)	(2.73)	(3.68)	(6.95)	(21.03)
2,220	447	387	581	422	3,020
(0.58)	(0.12)	(0.10)	(0.15)	(0.11)	(0.78)
78	81	45	98	76	547
(4.31)	(4.48)	(2.49)	(5.42)	(4.20)	(30.25)
5,388	8,027	4,509	4,334	2,638	18,511
(0.41)	(0.61)	(0.34)	(0.33)	(0.20)	(1.40)
570	8,602	2,091	4,250	4,326	6,250
(1.14)	(17.24)	(4.19)	(8.52)	(8.67)	(12.53)
386	438	227	177	110	2,089
(0.36)	(0.41)	(0.21)	(0.17)	(0.10)	(1.96)
111	11	57	38	38	77
(20.63)	(2.04)	(10.59)	(7.06)	(7.06)	(14.31)

Appendix 2.6

IRRIGATION POTENTIAL IN BASTAR (UP TO MARCH, 1976)

(in hectares)

Name of tehsil	Major and medium irrigation	Minor irrigation			
		Surface irrigation	Lift irriga- tion	Ground water	Total minor irrigation
(1)	(2)	(3)	(4)	(5)	(6)
Jagdulpur	—	367	—	—	367
Dantewada	314	783	—	29	812
Konta	6,398	335	—	—	335
Bijapur	—	695	—	—	695
Kondagaon	—	660	160	40	860
Narayanpur	—	744	—	—	744
Kanker	1,464	2,414	—	598	3,012
Bhanupratappur	8,176	5,998	160	667	6,815

*Appendix 2.7***BLOCKWISE GROUNDWATER POTENTIAL IN BASTAR**

<i>Name of block</i>	<i>Annual ground-water recharge in hectare meter</i>	<i>Annual ground-water withdrawn in hectare meter</i>	<i>Ground water in balance (hectare meter)</i>	<i>Total No. of additional feasible wells</i>	<i>Total expected area to be irrigated in hectares)</i>
(1)	(2)	(3)	(4)	(5)	(6)
Jagdalpur					
Jagdalpur	862.95	96.80	766.15	638	1,276
Bastar	1,312.32	161.60	1,150.72	959	1,918
Bakawand	1,258.68	56.70	1,201.98	1,002	2,004
Tokapal	588.05	20.60	567.45	473	946
Lohandiguda	989.19	19.40	969.79	808	1,616
Darbha	947.31	3.70	943.61	786	1,572
Bastanar	1,196.36	2.00	1,194.36	995	1,990
Total	7,154.86	360.80	6,794.06	5,661	11,322
Dantewada					
Dantewada	1,575.63	8.40	1,567.20	1,306	2,612
Geedam	1,455.76	8.10	1,447.66	1,206	2,412
Kuakonda	1,485.16	Nil	1,485.16	1,238	2,476
Katekalyan	1,094.65	Nil	1,094.65	912	1,824
Total	5,611.20	16.50	5,594.67	4,662	9,324
Konta					
Chhindgarh	1,586.67	2.40	1,584.27	1,320	2,640
Sukma	1,449.53	Nil	1,449.53	1,207	2,414
Konta	1,066.28	7.20	1,059.08	882	1,764
Total	4,102.48	9.60	4,092.88	3,409	6,818
Bijapur					
Bijapur	1,262.63	4.90	1,257.73	1,048	2,096
Bhairamgarh	1,563.91	4.40	1,559.51	1,300	2,600
Bhopalpatnam	614.47	56.50	557.97	465	930
Usoor	813.52	7.10	806.52	672	1,344
Total	4,254.53	72.90	4,182.39	3,485	6,970
Kondagaon					
Kondagaon	1,356.00	198.40	1,157.60	965	1,930
Keshkal	1,002.84	58.00	944.84	787	1,574
Pharasaon	916.17	69.60	846.57	705	1,410
Makdi	782.14	115.50	666.64	556	1,112
Bade Rajpur	611.85	94.80	517.05	431	862
Total	4,669.00	536.30	4,132.70	3,444	6,888

Continued

(1)	(2)	(3)	(4)	(5)	(6)
Narayanpur					
Narayanpur	1,743.57	39.60	1,703.97	1,420	2,840
Antagarh	1,453.48	110.90	1,343.28	1,119	2,238
Koilibeda	1,081.94	89.90	992.04	827	1,654
Abujhmar	—Unsurveyed—				
Total	4,278.99	239.70	4,039.29	3,366	6,732
Kanker					
Kanker	849.48	107.50	741.98	618	1,236
Charama	932.13	700.50	231.63	193	386
Sarona	1,291.99	382.80	909.19	758	1,516
Total	3,073.60	1,190.80	1,882.80	1,569	3,138
Bhanupratappur					
Bhanupratappur	1,180.80	116.30	1,064.58	887	1,774
Durgakondal	1,132.51	81.11	1,051.40	876	1,752
Total	2,313.31	197.41	2,115.98	1,763	3,526
District	35,457.97	2,624.01	32,834.70	27,359	54,718

Appendix 2.8
TEHSILWISE LAND USE PATTERN IN BASTAR 1971

Item	Name of tehsil									
	Jagdalpur	Dantewada	Konta	Bijapur	Kondagaon	Narayanpur	Kanker	Bhanupra- tapur	District	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Total geographical area	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Area under forestry	20.30	15.00	66.68	51.10	53.90	54.76	13.21	30.64	47.43	
Area under pasture	9.89	—	0.12	17.87	2.51	0.01	13.97	2.87	6.20	
Land under tree crops and groves	—	0.08	0.02	2.42	0.02	0.01	0.00	0.01	2.41	
Cultivated waste lands	3.75	14.11	1.57	9.60	4.20	5.24	2.53	4.14	5.11	
Other fallow lands	1.50	2.06	1.46	1.21	3.04	0.64	2.49	3.55	1.62	
Current fallows	1.70	7.23	1.16	1.02	1.33	0.74	2.85	3.68	1.85	
Net sown area	35.45	45.68	18.27	13.83	27.21	6.85	46.80	36.20	23.18	

Appendix 2.9

GROWTH OF CULTIVABLE WASTE LAND, FALLOW LAND AND NET SOWN AREA IN BASTAR

Item	(in '000 hectares)								
	1968- 69	1969- 70	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total cultivable waste land	135	151	94	94	161	270	214	159	130
Fallow land									
Current	49	50	47	47	50	47	51	44	57
Old	61	60	59	59	58	53	45	45	46
Total	110	110	106	106	108	100	96	89	103
Net area sown	690	697	704	704	703	739	743	765	747
Area sown more than once	31	31	34	34	35	37	34	40	24
Total cropped area	721	728	738	738	738	776	778	805	771

Appendix 2.11
GROWTH IN AREA UNDER VARIOUS CROPS IN BASTAR

Crop	1965-66	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Paddy	414.12	437.69	445.59	443.08	450.45	451.61	458.27	459.64
Wheat	1.68	2.40	2.46	2.69	2.62	2.43	3.71	3.32
Jowar	4.16	6.20*	6.14	6.76	8.06	8.07	6.84	7.44
Maize	21.50	15.36	24.73	26.76	27.38	28.25	29.38	28.66
Other small millets	142.09	142.09	137.23	152.87	163.56	153.04	167.37	173.88
Total cereals	577.21	624.91	629.12	625.44	652.18	654.66	679.42	672.95
Pulses	56.42	62.34	60.81	60.06	65.08	62.42	62.51	50.43
Sugarcane	1.69	1.14	1.08	0.67	1.20	1.09	0.94	1.01
Total fruits	3.56	2.17	1.83	2.07	1.83	2.12	2.09	2.08
Potato	0.15	0.05	0.07	0.05	0.05	0.06	0.06	0.07
Other vegetables	8.17	2.94	4.08	4.11	4.46	4.66	4.32	4.57
Total vegetables	8.32	3.00	4.15	4.16	4.51	4.72	4.38	4.64
Spices and condiments	—	1.03	1.16	1.20	1.23	1.29	1.17	1.34
Total foodgrains	647.21	694.58	698.15	693.61	726.05	726.30	750.52	732.44
Linseed	5.60	3.21	2.96	2.79	3.22	3.24	2.89	2.23
Castor	3.63	4.44	4.51	4.62	6.03	3.91	6.22	4.30
Groundnut	0.01	0.02	—	0.02	—	—	—	—
Other oilseeds	69.80	32.71	35.22	35.63	46.05	43.07	44.13	30.83
Total oilseeds	79.03	40.36	41.57	43.06	55.31	50.23	53.25	37.36
Fibres	0.61	0.75	0.60	0.53	0.53	0.57	1.05	0.75
Total non-foodgrains	69.99	4.11	42.17	43.59	55.84	50.80	54.30	38.11
Grand Total	673.00	735.69	740.32	737.20	781.89	777.10	804.82	770.55

Appendix 2.12

LEVELS AND GROWTH OF AREA, PRODUCTION AND PRODUCTIVITY IN INDIA, MADHYA PRADESH, MAHARASHTRA, BASTAR AND CHANDRAPUR

State/district	Average for (1962-63, 63-64 and 64-65)			Average for (1970-71, 71-72 and 72-73)			Percentage compound growth rate (1962-65 to 1970-73)		
	Area (hectare)	Output (tonnes)	Yield (kg/hect.)	Area (hec.)	Production (tonnes)	Yield (kg/hect.)	Area	Output	Yield
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rice									
India	3,53,33,513	3,58,66,513	1,015	3,60,23,360	3,98,26,616	1,106	.24	1.32	1.07
Madhya Pradesh	42,58,096	30,52,429	717	44,42,526	34,65,340	780	.53	1.60	1.06
Bastar	4,07,011	3,07,237	755	4,39,095	3,30,737	753	.95	.92	— .02
Maharashtra	13,54,052	14,11,564	1,042	13,21,694	12,56,620	951	— .29	— 1.43	— 1.13
Chandrapur	2,18,535	1,84,548	844	2,26,716	1,86,897	824	.46	.16	— .29
Wheat									
India	1,34,52,231	1,09,13,843	811	1,83,57,672	2,43,64,243	1,322	3.96	10.50	6.29
Madhya Pradesh	32,39,758	20,15,806	622	33,71,359	25,91,646	769	.50	3.19	2.68
Bastar	2,658	1,550	583	2,531	1,796	710	— .60	1.86	2.48
Maharashtra	8,84,957	4,00,612	453	8,60,633	4,00,800	466	— .34	.01	.35
Chandrapur	42,033	19,813	471	38,266	18,000	470	— 1.16	— 1.18	— .02

Continued

State/ district	Percentage (annual) compound growth rate 1970-73 over 1962-65															
	Maize		Ragi		Gram		Tur		Groundnut							
	A	O	A	O	A	O	A	O	A	O	A	O	A	O	A	O
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(26)
India	2.70	3.81	1.08	-0.75	0.16	0.93	-2.76	-0.74	1.56	-0.49	0.77	1.28	-0.10	-0.53	-0.42	
Madhya Pradesh	2.41	0.05	-2.30	1.94	1.23	-0.69	1.20	2.44	1.22	2.49	5.77	3.20	-0.18	-0.24	-0.05	
Bastar	2.89	2.72	-0.15	2.88	1.81	-1.09	-1.54	-1.24	0.31	-2.64	0.82	3.57	-1.00	-1.00	-1.00	
Maharashtra	0.16	3.23	3.07	-0.76	-1.36	-0.59	0.72	-4.22	-3.51	-0.47	-3.68	-3.21	-3.93	-7.67	-3.88	
Chandrapur	3.36	6.27	2.81	3.57	17.49	13.44	2.11	1.45	-0.63	2.23	-3.65	-5.76	22.28	22.28	22.28	

	Percentage (annual) compound growth rate 1970-73 over 1962-65															
	Rapeseed and mustard		Linseed		Castor		Sugarcane		Cotton							
	A	O	A	O	A	O	A	O	A	O	A	O	A	O	A	O
(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(42)
India	1.57	4.06	2.44	1.34	0.37	1.74	-1.35	3.63	5.04	0.67	1.76	1.08	-0.64	0.32	1.01	
Madhya Pradesh	3.11	4.85	1.69	-0.65	1.35	2.02	-3.74	-3.74	0.01	-0.30	0.36	0.67	1.46	-3.46	-2.01	
Bastar	-0.08	2.07	2.16	-3.59	-1.77	1.89	2.49	3.01	0.51	8.81	10.10	1.18	0.00	0.00	0.00	
Maharashtra	2.04	2.68	0.62	-0.16	-1.97	-1.80	-2.62	3.22	5.99	3.78	3.22	-0.53	-0.88	-5.79	-4.94	
Chandrapur	-2.34	0.00	0.00	-0.34	5.83	6.20	-0.11	0.00	0.00	-4.24	0.48	4.93	3.94	7.94	3.85	

A=Area; O=Output; Y=Yield

Appendix 2.13
GROWTH IN THE PRODUCTIVITY OF MAJOR CROPS IN BASTAR

Years	Paddy	Wheat	Bajra	Jowar	Gram	Arhar	Groundnut	Seasamum	Linseed	Fibres and sunhemp	Sugarcane (kg./hec)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1968-69	730	628	976	766	303	801	413	156	143	351	3,214
1969-70	807	667	997	767	392	895	579	126	219	369	3,309
1970-71	762	805	1,433	852	347	1,190	600	103	193	320	3,309
1971-72	812	798	1,172	861	381	984	582	122	203	371	3,286
1972-73	1,225	427	503	304	285	1,028	571	101	168	351	3,194
1973-74	1,278	572	673	504	381	1,446	897	168	202	448	3,923
1974-75	1,399	572	—	504	381	1,446	—	326	729	—	3,923
1975-76	2,120	880	—	870	380	1,450	550	170	200	—	3,900
1976-77	763	626	458	440	252	874	252	—	125	—	3,186

SOURCE: Land Record Office, Jagdalpur.

Appendix 2.14

GROWTH IN THE NUMBER OF AGRICULTURAL MACHINERY AND IMPLEMENTS IN BASTAR

Years	Wooden plough	Iron plough	Bullock cart	Power driven crushers	Bullock driven crusher	Oil engines	Electric pumps	Tractors	Threshers
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1970-71	2,31,212	134	54,753	3	814	138	—	18	415
1971-72	2,40,260	164	57,167	8	893	326	147	93	310
1972-73	2,38,617	1,437	55,507	19	779	304	201	20	368
1973-74	2,38,574	127	57,337	6	895	426	237	33	328
1974-75	2,37,321	119	52,911	83	864	546	317	33	316
1975-76	2,45,771	73	53,956	20	546	773	355	73	269
1976-77	3,27,853	131	58,582	6	809	851	347	74	280

SOURCE: Land Record Office, Jagdalpur.

Appendix 2.15
LIVESTOCK AND ANIMAL STATISTICS IN BASTAR

Years	Used for artificial insemina- tion	Used only for work	Others	Total	Milch cattle	Buffaloes	Goats	Sheep	Horses and mules	Pigs	Cock and hens
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1969-70	434	80,295	1,182	81,911	18,065	1,32,214	3,44,990	10,135	307	1,23,357	5,90,564
1970-71	626	77,346	656	78,628	16,818	1,23,123	3,42,668	10,773	362	1,20,914	5,45,004
1971-72	94	85,627	722	87,434	21,588	1,35,273	2,91,240	9,973	255	41,521	7,76,255
1972-73	4,532	1,17,804	1,913	1,24,249	17,539	1,73,904	2,97,661	10,989	249	45,466	6,91,653
1973-74	6,790	80,456	2,422	89,668	16,229	25,767	3,08,499	11,284	213	42,126	7,00,063
1974-75	4,030	83,303	2,951	90,284	15,394	1,37,106	3,02,078	13,459	234	43,871	6,35,506
1975-76	3,107	82,034	3,068	88,209	15,301	1,31,390	2,99,054	13,090	226	43,521	6,51,932
1976-77	115	83,925	1,591	85,631	10,920	1,28,553	3,65,790	11,279	194	62,858	9,10,045

SOURCE: Land Record Office, Jagdalpur.

Appendix 2.16

CLASSIFICATION OF FORESTS IN BASTAR

Name of tehsil/range	Total area under forest	Reserved forest	Protected forest		Area handed over to revenue Dept. for allotment during the last 10 years	Land transferred to other concerned agencies during last 10 years
			Orange	Proposed reserve forest		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jagdalpur Tehsil	1,64,000	1,31,800	79,300	31,800	15,600	—
Jagdalpur Range	—	—	31,960	—	—	—
Machkati Range	—	—	6,240	—	—	—
Kanker Range	—	—	4,060	—	—	—
Darbha Range	—	—	1,060	—	—	—
Amravati Range	—	—	3,160	4,420	—	—
Bhanpuri Range	—	—	17,530	20,350	15,600	—
Bakawand Range	—	—	14,040	5,400	—	—
Madapal Range	—	—	1,250	1,630	—	—
Dantewada Tehsil	1,31,213	52,268	61,591	35,715	(—) 17,635	(—) 727
Geedam Range	—	—	28,373	21,955	(—) 17,635	(—) 727
Barsoor Range	—	—	28,815	11,235	—	—
Dantewada Range	—	—	4,402	2,524	—	—
Tongpal Range	—	—	—	—	—	—

Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Konta Tehsil						
Chhindgarh Block Tongpal Range	3,46,258	2,02,725	92,811	43,625	7,136	3 hect. to T.D.P.
Sukma Block/ Sukma Range	26,778	5,944	13,207	7,573	—	—
Konta Block/Konta Range	32,950	16,260	2,840	10,920	7,136	3 hect. to T.D.P.
Golapalli	67,897	34,641	21,436	7,709	—	—
Kistaram	59,875	59,875	—	—	—	—
Jagargunda	57,859	57,759	—	—	—	—
Total Konta Block	1,00,999	28,246	55,328	17,423	—	—
Bijapur Tehsil	2,86,530	1,80,521	76,764	25,132	—	—
Bijapur Range	5,03,378	2,51,850	12,236	2,51,528	19,835	—
Basaguda Range	—	31,574	636	10,887	1,771	—
Awapalli Range	—	30,083	113	15,561	4,557	—
Pamed Range	—	24,724	666	25,413	—	—
Bhavanigarh Range	—	35,939	228	32,022	228	—
Nelasnar Range	—	23,538	1,466	21,880	3,120	—
Bhopalpatnam Range	—	12,036	403	25,969	2,086	—
Maddled Range	—	29,818	1,534	27,211	90	—
Toinar Range	—	23,833	6,714	14,985	1,015	—
Kondagaon Tehsil	—	40,305	474	77,570	6,968	—
East Kanker Division	8,31,973	2,08,150	3,11,809	2,71,359	3,805	2,450
East Bastar Division	—	1,06,740	82,402	1,14,212	2,800	2,450
Narayanpur Tehsil	—	1,01,410	2,29,407	1,57,147	35,405	—
Narayanpur and Abujhmar Block	4,57,600	1,50,200	1,72,300	1,34,500	2,200	34,500
Narayanpur Range	51,700	30,800	16,000	4,900	100	100
Sonpur Range	89,200	26,500	53,400	9,300	100	400
Dhandai Range	27,000	3,300	1,500	22,200	800	1,400
Chhaledangar Range	98,800	21,600	67,700	9,500	400	—

Antagarh Block	76,200	24,900	5,000	46,300	500	—
Antagarh Range	50,700	13,600	600	36,500	300	—
Amabeda Range	25,500	11,300	4,400	9,800	200	—
Koilibeda Block	1,14,100	43,100	28,700	42,300	300	32,600
Paralkote Range	71,000	19,300	27,700	24,000	300	6,200
Kapsi Range	43,100	23,800	1,000	18,300	—	26,400
Kanker Tehsil	83,693	40,421	23,062	59,982	982	—
E.D.	—	31,833	22,242	14,501	982	—
W.D.	—	3,587	820	45,481	—	—
Bhanupratappur Tehsil	11,193	19,443	3,570	35,655	—	—
W.D.	11,193	19,443	3,570	36,655	—	—

SOURCE: Draft Sub-Plan, ITAD, 1976.

Appendix 2.17

GROWTH OF FOREST PRODUCE IN BASTAR

<i>Years</i>	<i>Timber (cmt.)</i>	<i>Bamboos (national tonnes)</i>	<i>Tendu patta (in standard bags)</i>	<i>Gums (in qntls.)</i>	<i>Harra (in qntls.)</i>	<i>Sal seed (in qntls.)</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1971-72	1,90,601	—	95,593	3,036	2,41,540	—
1972-73	1,79,411	—	1,14,582	2,576	59,678	—
1973-74	2,00,000	—	1,39,678	1,880	28,546	—
1974-75	1,79,220	4,954	1,36,397	1,418	42,964	—
1975-76	1,61,567	4,428	1,54,120	2,599	79,757	63,430

Appendix 2.18

DISTRIBUTION OF HEALTH FACILITIES IN BASTAR, 1976-77

<i>Tehsil/block</i>	<i>Hospital</i>	<i>Primary health centre</i>	<i>Ayurvedic dispensary</i>	<i>Civil dispensary</i>	<i>Ayurvedic dispensary</i>	<i>Rural family planning centre</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jagdalpur Tehsil	2	7	—	4	—	—
Jagdalpur	2	1	—	1	—	—
Bastar	—	1	—	1	—	—
Bakawand	—	1	—	2	—	—
Lohandiguda	—	1	—	—	—	—
Tokapal	—	1	—	—	—	—
Darbha	—	1	—	—	—	—
Bastanar	—	1	—	—	—	—
Dantewada Tehsil	1	4	5	—	—	—
Dantewada	1	1	1	—	—	—
Geedam	—	1	2	—	—	—
Kuakonda	—	1	2	—	—	—
Katekalyan	—	1	—	—	—	—
Konta Tehsil	—	3	3	—	1	1
Chhindgarh	—	1	1	—	—	1
Sukma	—	1	—	—	—	—
Konta	—	1	2	—	1	—
Bijapur Tehsil	—	4	5	3	—	—
Bijapur	—	1	2	—	—	—
Bhairamgarh	—	1	—	1	—	—
Bhopalpatnam	—	1	1	1	—	—
Usoor	—	1	2	1	—	—
Kondagaon Tehsil	—	5	6	—	—	—
Bade Rajpur	—	1	2	—	—	—
Kondagaon	—	1	3	—	—	—
Keshkal	—	1	1	—	—	—
Makdi	—	1	—	—	—	—
Pharasaon	—	1	—	—	—	—

Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Narayanpur Tehsil	—	4	2	—	—	—
Narayanpur	—	1	1	—	—	—
Antagarh	—	1	1	—	—	—
Koilibeda	—	1	—	—	—	—
Abujhmar	—	1	—	—	—	—
Kanker Tehsil	3	2	2	—	—	—
Kanker	1	1	—	—	—	—
Charama	1	1	1	—	—	—
Sarona	1	1	1	—	—	—
Bhanupratappur Tehsil	—	3	—	—	—	—
Bhanupratappur	—	1	—	—	—	—
Durgakondal	—	1	—	—	—	—
District	6	33	23	7	1	1

Appendix 2.19

BLOCKWISE AREA AND POPULATION IN CHANDRAPUR

<i>Name of taluk/ panchayat block</i>	<i>Area in sq km</i>	<i>Total population</i>	<i>Scheduled castes</i>	<i>Scheduled tribes</i>	<i>Per cent of scheduled tribes to total popu- lation</i>
(1)	(2)	(3)	(4)	(5)	(6)
Chandrapur	3,040	4,01,000	16,800	—	—
Chandrapur	803	2,04,000	11,900	—	—
Mul	724	1,13,000	3,000	—	—
Gondpipri	458	84,000	1,900	—	—
Warora	3,320	3,10,000	12,800	—	—
Warora	907	1,17,000	4,400	—	—
Bhadrawati	782	93,000	5,600	—	—
Chimur	820	1,00,000	2,800	—	—
Brahmapuri	2,323	2,81,000	7,700	—	—
Brahmapuri	530	98,000	1,700	—	—
Sindewahi	537	93,000	2,900	—	—
Nagbhid	554	90,000	3,100	—	—
Gadchiroli	7,433	3,82,000	14,300	1,23,300	32.28
Gadchiroli	461	57,000	2,500	11,200	19.65
Armori	628	1,00,000	6,000	19,600	19.60
Chamorshi	681	1,16,000	3,700	21,500	18.53
Dhanora	1,120	49,000	900	35,000	71.43
Kurkheda	957	60,000	1,200	36,000	60.00
Sironcha	8,006	1,40,000	16,800	74,300	53.07
Sironcha	315	40,000	9,000	7,100	17.15
Aheri	783	54,000	6,300	28,700	53.15
Yetapalli	1,482	46,000	1,500	38,500	83.70
Rajura	2,011	1,26,000	8,500	33,800	26.83
Rajura	2,011	1,26,000	8,500	33,800	26.83
District	25,641	16,40,000	76,900	2,31,200	14.10

Appendix 2.20

BLOCKWISE DISTRIBUTION OF VILLAGES BY SIZE OF POPULATION
IN CHANDRAPUR 1971

Name of tehsil/ block	Total No. of inhabi- ted villages	No. of villages with population						
		Less than 200	200- 499	500- 999	1000- 1999	2000- 4999	5000- 9999	10,000- and above
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Chandrapur	388	79	119	109	57	21	2	1
Chandrapur	123	24	40	35	17	6	1	—
Mul	120	28	28	24	27	11	1	1
Gondpipri	145	27	51	50	13	4	—	—
Warora	445	83	162	131	59	6	3	1
Warora	165	21	70	54	18	2	—	—
Bhadrawati	129	25	41	39	20	3	—	1
Chimur	151	37	51	38	18	1	3	—
Brahmapuri	342	72	91	94	56	24	4	1
Brahmapuri	107	19	26	28	22	11	—	1
Sindewahi	115	26	34	32	12	9	2	—
Nagbhid	120	27	31	34	22	4	2	—
Gadchiroli	860	400	238	142	58	19	3	—
Gadchiroli	103	43	20	23	15	1	1	—
Armori	119	26	37	33	14	8	1	—
Chamorshi	182	58	52	41	23	7	1	—
Dhanora	259	178	65	14	—	1	—	—
Kurkheda	197	95	64	31	5	2	—	—
Sironcha	556	345	146	49	10	5	1	—
Sironcha	98	45	30	15	4	4	—	—
Aheri	179	104	44	24	5	1	1	—
Yetapalli	279	196	72	10	1	—	—	—
Rajura	249	78	79	70	20	2	—	—
Rajura	249	78	79	70	20	2	—	—
District	2,840	1,057	835	595	260	77	13	3

SOURCE: 1. 1971 Population Census.

2. Data Bank Section, Directorate of Economics and Statistics, Bombay.

Appendix 2.21

**TEHSILWISE NUMBER OF HOUSEHOLDS AND NUMBER ON
OCCUPIED RESIDENTIAL HOUSES IN CHANDRAPUR
1961-71**

Name of tehsil		No. of occupied residential houses			Number of households		
		Rural	Urban	Total	Rural	Urban	Total
(1)		(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	1961	43,699	15,428	59,127 (94.27)	46,749 (74.90)	15,667 (25.10)	62,416 (100.00)
	1971	51,128	19,418	70,546 (86.48)	57,442 (70.41)	24,135 (29.59)	81,577 (100.00)
Warora	1961	44,749	2,954	47,703 (95.26)	47,102 (94.06)	2,977 (5.94)	50,079 (100.00)
	1971	51,554	4,387	55,941 (86.98)	58,437 (90.86)	5,876 (9.14)	64,313 (100.00)
Brahmapuri	1961	43,279	—	43,279 (92.42)	46,829 (100.00)	— (0.00)	46,829 (100.00)
	1971	51,570	—	51,570 (91.95)	56,082 (100.00)	— (0.00)	56,082 (100.00)
Gadchiroli	1961	51,651	—	51,651 (93.39)	55,309 (100.00)	— (0.00)	55,309 (100.00)
	1971	64,970	1,672	66,642 (90.72)	71,338 (97.11)	2,123 (2.89)	73,461 (100.00)
Sironcha	1961	21,350	—	21,350 (96.00)	22,240 (100.00)	— (0.00)	22,240 (100.00)
	1971	25,633	—	25,633 (95.93)	26,832 (100.00)	— (0.00)	26,832 (100.00)
Rajura	1961	16,675	2,155	18,830 (96.00)	17,453 (89.00)	2,162 (11.00)	19,615 (100.00)
	1971	20,767	2,320	23,087 (92.39)	24,461 (89.86)	2,535 (10.14)	24,996 (100.00)
District	1961	2,21,403	20,537	2,41,940 (94.33)	2,35,682 (91.89)	20,806 (8.11)	2,56,488 (100.00)
	1971	2,65,622	27,805	2,93,427 (89.66)	2,92,592 (89.41)	34,669 (10.59)	3,27,261 (100.00)

NOTE: Figures within brackets are percentages. In col. 4 the percentage of occupied residential houses to total households is given; whereas Cols. 5 and 6 are percentages of rural and urban households respectively to total households.

TEHSILWISE OCCUPATIONAL PATTERN

<i>Name of tehsil</i>		<i>Total popula- tion</i>	<i>Total workers</i>	<i>Cultivators</i>	<i>Agricul- tural labour</i>	<i>Mining quarry- ing</i>	<i>Manu- facturing of house- hold industry</i>
(1)		(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	1961	2,96,807 (100.00)	1,59,070 (53.59)	81,160 (51.02)	31,469 (19.78)	10,488 (6.59)	8,917 (5.61)
	1971	4,00,800	1,45,559 (36.33)	55,000 (37.78)	38,000 (26.11)	10,800 (7.42)	5,700 (3.92)
Warora	1961	2,38,323	1,37,257 (57.59)	66,292 (48.30)	46,798 (34.10)	4,102 (2.99)	6,653 (4.85)
	1971	3,09,800	1,25,800 (40.61)	42,300 (33.62)	57,000 (45.31)	4,300 (3.42)	5,100 (4.05)
Brahmapuri	1961	2,26,924	1,36,610 (60.20)	80,242 (58.73)	36,227 (26.52)	3,835 (2.81)	6,285 (4.60)
	1971	2,81,400	1,24,700 (44.31)	55,400 (44.43)	52,700 (42.26)	2,800 (2.25)	4,300 (3.45)
Gadchiroli	1961	2,77,398	1,69,002 (60.92)	1,13,546 (67.19)	35,772 (21.17)	4,186 (2.48)	6,064 (3.59)
	1971	3,81,800	1,63,100 (42.72)	94,900 (58.19)	49,100 (30.10)	3,000 (1.84)	3,900 (2.39)
Sironcha	1961	1,08,994	60,828 (55.80)	36,479 (60.57)	14,125 (23.45)	2,112 (3.15)	2,128 (3.53)
	1971	1,40,500	57,400 (40.85)	29,500 (51.39)	19,200 (33.45)	2,200 (3.83)	1,500 (2.61)
Rajura	1961	89,624	52,493 (58.57)	30,110 (57.36)	14,853 (28.30)	2,669 (5.08)	1,310 (2.50)
	1971	1,25,800	47,900 (38.08)	21,900 (45.72)	17,700 (36.95)	2,400 (5.01)	1,300 (2.71)
Chandrapur District	1961	12,38,070	7,15,260 (57.78)	4,07,829 (57.01)	1,79,244 (25.06)	27,392 (3.83)	31,557 (4.38)
	1971	16,40,100	6,64,500 (40.52)	2,99,000 (45.00)	2,33,700 (35.17)	25,500 (3.83)	21,800 (3.28)

2.22

IN CHANDRAPUR, 1961-71

<i>Manufacturing other than household industry</i>	<i>Construction</i>	<i>Trade and commerce</i>	<i>Transport, storage and communication</i>	<i>Other services</i>	<i>Total non-workers</i>
(8)	(9)	(10)	(11)	(12)	(13)
4,848	1,217	4,897	2,790	13,284	1,37,737
(3.05)	(0.77)	(3.08)	(1.75)	(8.35)	(46.41)
9,600	1,900	5,700	3,500	14,400	2,55,200
(6.60)	(1.31)	(3.92)	(2.40)	(9.89)	(83.67)
1,142	423	3,113	953	7,781	1,01,066
(0.83)	(0.31)	(2.27)	(0.69)	(5.67)	(42.41)
2,300	1,500	3,500	1,200	8,600	1,84,000
(1.83)	(1.19)	(2.78)	(0.95)	(6.84)	(59.39)
1,012	354	2,199	915	5,541	90,314
(0.74)	(0.26)	(1.61)	(0.67)	(4.06)	(39.80)
1,100	500	2,200	500	5,200	1,56,700
(0.88)	(0.40)	(1.76)	(0.40)	(4.17)	(55.69)
667	273	2,201	249	5,994	1,08,396
(0.39)	(0.16)	(1.32)	(0.15)	(3.55)	(39.08)
1,300	1,500	2,700	500	6,200	2,18,700
(0.80)	(0.92)	(1.66)	(0.31)	(3.80)	(57.28)
346	170	726	60	4,682	48,166
(0.57)	(0.28)	(1.21)	(0.10)	(7.78)	(44.20)
600	400	800	200	3,000	83,100
(1.05)	(0.69)	(1.39)	(0.35)	(5.23)	(59.15)
254	86	589	248	2,374	37,131
(0.48)	(0.16)	(1.12)	(0.47)	(4.52)	(41.43)
700	600	700	400	2,200	77,900
(1.46)	(1.25)	(1.46)	(0.83)	(4.59)	(61.92)
8,269	2,523	13,775	5,215	39,656	5,22,810
(1.12)	(0.35)	(1.93)	(0.73)	(5.54)	(42.22)
15,600	6,400	16,600	6,300	39,600	9,75,600
(2.35)	(0.96)	(2.50)	(0.95)	(5.96)	(59.48)

Appendix 2.23

BLOCKWISE IRRIGATED AREA BY DIFFERENT SOURCES
IN CHANDRAPUR, 1973-74

(in hectares)

<i>Block/tehsil</i>	<i>Govt. canals</i>	<i>Tanks</i>	<i>Wells</i>	<i>Others</i>	<i>Total</i>
(1)	(2)	(3)	(4)	(5)	(6)
Chandrapur	665	1,805	129	11	2,610
Mul	8,877	10,062	92	244	19,175
Gondpipri	—	4,002	157	804	4,963
Tehsil Total	9,542	15,869	368	959	26,748
Warora	109	2,551	159	289	3,208
Bhadrawati	—	2,765	117	285	3,067
Chimur	—	7,843	200	1,142	9,185
Tehsil Total	109	13,159	476	1,616	15,360
Brahmapuri	—	6,762	170	329	7,261
Nagbhid	2,538	9,831	27	42	12,437
Sindewahi	5,750	9,560	85	1,551	16,945
Tehsil Total	8,288	26,153	281	1,921	36,643
Gadchiroli	—	8,957	180	620	9,757
Armori	178	7,227	162	1,473	9,040
Dhanora	178	2,275	172	402	4,849
Kurkheda	—	3,380	107	902	4,389
Chamorshi	580	6,985	82	120	7,767
Tehsil Total	758	28,824	703	3,517	33,802
Sironcha	—	450	50	472	972
Aheri	—	530	80	370	940
Yetapalli	—	765	32	268	1,058
Tehsil Total	—	1,735	121	1,110	2,966
Rajura	—	446	25	98	569
District	18,697	86,286	1,984	9,222	1,16,088

Appendix 2.24
GROWTH OF IRRIGATED AREA BY DIFFERENT SOURCES
IN CHANDRAPUR

(in hectares)

Source	Name of taluk						Total
	Chandra- pur	Warora	Brahma- puri	Gadchi- roli	Sironcha	Rajura	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Canal							
1968-69	9,542	109	8,272	749	—	—	18,672
1969-70	9,356	109	8,288	758	—	—	18,511
1970-71	9,611	69	8,414	788	—	—	18,879
1971-72	9,443	116	8,565	758	—	—	18,882
1972-73	8,833	116	8,559	3,464	—	—	20,927
1973-74	9,313	115	9,584	4,704	—	—	23,716
1974-75	8,984	114	8,399	4,603	—	—	22,100
Tank							
1968-69	16,864	12,904	25,706	28,202	1,636	444	85,756
1969-70	17,070	13,159	26,153	28,824	1,735	446	87,387
1970-71	15,593	12,033	25,086	26,740	1,961	199	81,612
1971-72	16,283	12,996	25,658	28,748	1,665	259	85,609
1972-73	16,287	11,680	25,385	27,973	1,854	258	83,437
1973-74	18,087	11,534	26,737	28,029	1,948	265	86,620
1974-75	17,685	11,566	24,243	22,996	1,903	235	78,628
Wells							
1968-69	378	426	274	703	196	3	1,980
1969-70	336	476	281	625	121	25	1,864
1970-71	300	396	295	783	61	23	1,758
1971-72	311	509	335	767	117	18	2,057
1972-73	162	390	169	723	52	7	1,503
1973-74	405	310	339	532	76	10	1,672
1974-75	302	379	186	973	425	13	2,278
Other Sources							
1968-69	959	341	789	949	318	—	3,356
1969-70	818	319	591	829	475	—	3,022
1970-71	1,799	1,470	1,116	1,231	439	—	6,045
1971-72	997	344	1,139	932	694	—	4,100
1972-73	1,152	349	967	1,109	664	—	4,241
1973-74	98	668	930	956	903	6	3,561
1974-75	107	805	490	1,062	547	7	3,018

Appendix 2.25

STATE/DISTRICT AND TALUKWISE DISTRIBUTION OF IRRIGATED AREA SOURCEWISE
(AVERAGE OF THREE YEARS 1972-73 to 1974-75)

State/district/ tehsil	Irrigated area (in hect.) by				Net irrigated area	Net sown area	Per cent of area irrigated to net sown area	Area irrigated more than once
	Canal	Tanks	Wells	Others				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Maharashtra state	2,90,000 (20.29)	2,16,000 (15.11)	8,15,000 (57.03)	1,08,000 (7.55)	14,29,000 (100.00)	1,75,39,330	(8.14)	1,89,800
Chandrapur district	22,262 (22.18)	82,834 (75.08)	1,818 (1.65)	3,417 (3.10)	1,10,331 (100.00)	6,56,650	(16.80)	2,430
Chandrapur	9,043 (33.32)	17,353 (63.94)	289 (1.06)	452 (1.67)	27,137 (100.00)	1,28,087	(21.19)	172
Warora	115 (0.90)	11,593 (91.46)	360 (2.84)	607 (4.79)	12,675 (100.00)	1,80,387	(7.02)	245
Brahmapuri	8,847 (25.11)	25,455 (72.26)	231 (0.66)	796 (2.26)	35,229 (100.00)	84,300	(41.79)	1,681
Gadchiroli	4,258 (13.35)	26,339 (82.49)	743 (2.30)	1,042 (3.26)	31,928 (100.00)	1,09,636	(29.54)	218
Sironcha	—	1,908 (68.22)	184 (6.58)	705 (25.21)	2,797 (100.00)	61,420	(5.44)	110
Rajura	—	253 (93.70)	10 (3.70)	5 (1.85)	270 (100.00)	92,614	(0.29)	4

Appendix 2.26

GROWTH OF NET AND GROSS IRRIGATED AREA IN CHANDRAPUR

(in hectares)

Name of taluk							
	Chandra- pur	Warora	Brahma- puri	Gadchi- roli	Sironcha	Rajura	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net irrigated area							
1968-69	27,743	13,780	35,041	30,603	2,150	447	1,09,764
1969-70	27,580	14,063	35,313	31,036	2,331	471	1,10,794
1970-71	27,303	13,958	34,911	29,439	2,461	222	1,08,294
1971-72	27,028	13,965	35,697	31,205	2,476	277	1,10,648
1972-73	26,434	12,535	35,080	33,269	2,570	265	1,10,153
1973-74	27,903	12,627	37,590	34,221	2,947	281	1,15,569
1974-75	27,073	12,864	33,318	29,634	2,875	255	1,06,024
Gross irrigated area							
1968-69	27,857	13,780	35,477	30,749	2,240	447	1,10,565
1969-70	27,706	14,063	35,779	31,218	2,444	471	1,11,681
1970-71	27,303	14,251	35,660	29,499	2,595	222	1,09,530
1971-72	27,028	14,132	36,181	31,361	2,610	277	1,11,589
1972-73	26,434	12,734	35,447	33,269	2,704	265	1,10,853
1973-74	28,075	13,027	38,370	34,615	2,973	285	1,17,345
1974-75	27,078	13,014	37,002	29,685	3,051	255	1,10,085

Appendix 2.27

WATERSHEDWISE GROUNDWATER POTENTIAL IN CHANDRAPUR

<i>Sl. No.</i>	<i>Watershed No. and tehsil</i>	<i>Annual ground water recharge in acre ft.</i>	<i>Annual ground water withdrawal in acre ft.</i>	<i>Ground water in balance (acre ft.)</i>	<i>Total No. of additional irrigation wells feasible</i>
(1)	(2)	(3)	(4)	(5)	(6)
1.	WG-13 Gadchiroli	8,542.24	187.00	8,355.24	348
2.	WG-14 Brahmapuri	6,002.40	1,053.53	4,948.87	201
3.	WG-15 Brahmapuri	2,222.68	698.12	1,524.56	63
4.	WG-16 Brahmapuri	17,608.94	200.36	17,408.58	725
5.	WG-17 Chandrapur	20,288.37	449.77	19,838.60	826
6.	WG-18 Chandrapur	3,145.71	79.21	30.66.43	127
7.	WG-19 Gadchiroli	17,616.69	953.13	16,663.56	694
8.	WG-20 Chandrapur	5,838.97	513.56	5,325.41	221
9.	WG-21 Gadchiroli	18,729.96	49.67	18,680.29	778
10.	WGL Chandrapur	8,506.88	281.35	8,225.53	342
11.	WGA-1 Chandrapur	16,219.91	670.40	15,549.51	647
12.	WGA-2 Chandrapur	23,026.13	396.88	22,629.25	942
13.	WGA-3 Chandrapur	7,841.27	110.70	7,729.57	322
14.	WGA-4 Chandrapur	18,190.98	148.50	18,042.48	751
15.	WGA-5 Brahmapuri	16,436.98	88.17	15,636.60	651
	WGA-5 Warora				
16.	WGA-6 Warora				
	WGA-6 Chandrapur	11,505.97	Nil	11,505.97	479
17.	WGAM-1 Chandrapur	3,212.69	371.09	2841.60	118

Continued

(1)	(2)	(3)	(4)	(5)	(6)
18.	WGAM-2 Chandrapur	6,460.63	198.42	6,262.21	260
19.	WGAM-3 Brahmapuri	15,090.60	309.29	14,781.31	616
	WGAM-3 Chandrapur				
20.	WGAM-4 Brahmapuri	15,114.32	520.19	14,594.13	608
21.	WGAM-5 Warora	14,376.32	129.20	14,246.92	593
	WGAM-5 Brahmapuri				
22.	WGAM-6 Brahmapuri	17,280.90	97.24	17,183.66	715
	WGAM-6 Chandrapur				
23.	WGAMP Brahmapuri	18,634.58	197.32	18,437.24	768
	WGAMP Chandrapur				
24.	WGAMJ Brahmapuri	15,576.11	218.68	15,357.43	639
25.	WGAMB Brahmapuri	21,670.75	616.50	21,058.25	877
26.	WGAMH-1 Warora	10,019.13	158.38	9,860.75	410
	WGAMH-1 Brahmapuri				
27.	WGAMH-2 Warora	6,954.75	133.54	6,821.21	284
	WGAMH-2 Brahmapuri				
28.	WGAMH-3 Warora	10,244.90	194.22	10,110.68	421
29.	WGAMH' Warora	5,342.98	433.94	4,909.04	204
30.	WGAMN Warora	7,073.63	98.07	6,975.56	290
31.	WGAMG Warora	23,838.01	204.40	23,633.61	984
32.	WGAMK Warora	13,668.97	326.51	13,342.46	555
33.	WGAMG' Warora	7,882.01	51.47	7,830.54	326
34.	WGAMA Brahmapuri	7,539.51	171.39	7,522.12	313

Continued

(1)	(2)	(3)	(4)	(5)	(6)
35.	WGB-1 Brahmapuri	22,091.85	2,024.27	20,667.58	836
36.	WGM-2 Warora	8,556.81	187.92	8,368.89	348
37.	WGGD Gadchiroli	14,665.30	102.52	14562.78	601
38.	WGGC Gadchiroli	4,262.40	Nil	4,262.40	177
39.	WGG-3 Gadchiroli	1,378.45	34.03	1,344.42	56
40.	WGG-7 Gadchiroli	2,456.09	72.93	2,383.16	99
41.	WGG-8 Gadchiroli	6,461.04	110.66	6350.38	264
42.	WGG-9 Gadchiroli	12,939.90	236.54	12,703.36	529
43.	WGG-10 Gadchiroli	13,267.38	305.93	12,961.45	540
44.	WGKST Gadchiroli	5,121.61	17.39	5,204.22	216
45.	WGKS-1 Gadchiroli	12,110.97	319.58	11,719.39	491
46.	WGKS-2 Gadchiroli	13,217.85	354.92	12,862.93	536
47.	WGKS-3 Gadchiroli	11,452.72	97.24	11,355.48	473
48.	WGKD Gadchiroli	8,709.12	233.37	8475.75	252
49.	WGKD-2 Gadchiroli	5,255.24	158.38	5,096.86	162
50.	WGKT Gadchiroli	12,438.08	106.96	12,331.12	513
51.	WGKB Gadchiroli	13,304.35	192.42	13,111.93	546
52.	WGK-1 Gadchiroli	19,950.54	306.49	19,644.05	817
53.	WGK-2 Gadchiroli	5,396.04	762.02	4,634.02	183
54.	WGK-3 Gadchiroli	1,355.28	214.67	1,140.61	47
55.	WGK-4 Gadchiroli	14,700.26	413.27	14,286.99	595
56.	WGPA Godchiroli	18,422.60	285.64	18,136.96	755
57.	WGKK Gadchiroli	1,585.81	394.57	1,191.24	49

Continued

(1)	(2)	(3)	(4)	(5)	(6)
58.	WGK'-1 Gadchiroli	14,159.13	586.61	13,572.52	586
59.	WGK'-2 Gadchiroli	15,589.37	486.38	15,102.99	629
60.	WGK'-3 Gadchiroli	9,843.33	221.59	9,621.74	401
61.	WGK'-4 Gadchiroli	4,210.76	14.58	4,196.18	174
62.	WGP Gadchiroli	15,772.65	285.54	15,487.11	645
63.	WGP-1 Gadchiroli	14,956.39	174.98	14,781.41	615
64.	WGP-2 Gadchiroli	10,884.36	451.23	10,433.13	434
65.	WGP Gadchiroli	8,475.88	228.51	8,247.37	343
66.	WGPS Gadchiroli	16,064.75	165.30	15,899.45	662
67.	WGPM-1 Gadchiroli	9,542.09	24.31	9,517.78	396
68.	WGPM-2 Gadchiroli	14,657.61	160.41	14,497.17	604
69.	WGPM-3 Gadchiroli	10,229.80	Nil	10,229.80	426
70.	WR-16 Rajura	16,744.71	161.78	16,582.63	691
71.	WR-17 Rajura	14,938.35	528.83	14,409.52	600
72.	WR-18 Rajura	24,093.39	422.74	2,3670.65	986
73.	WR-19 Chandrapur	19,445.11	228.25	19,216.86	800
74.	WR-20 Chandrapur	16,772.86	324.61	16,448.25	685
75.	WR-21 Warora	22,061.63	505.86	21,555.80	898
	WR-21				
	Chandrapur				
76.	WR-22 Warora	15,749.52	134.72	15,614.80	650
77.	WRE-1 Chandrapur	16,324.53	687.32	15,637.21	651
78.	WRE-2 Chandrapur	11,176.46	113.60	11,062.86	460

Continued

(1)	(2)	(3)	(4)	(5)	(6)
79.	WRE-3 Warora WRE-3 Chandrapur	10,337.54	Nil	10,337.54	430
80.	WRE-4 Warora	4,826.04	Nil	4,826.04	201
81.	WREK Warora	11,137.81	29.90	11,107.91	462
82.	WREC-1 Warora	28,151.41	405.30	27,746.11	1,156
83.	WREC-2 Warora	17,966.07	603.31	17,360.76	723
84.	WRW-1 Warora	4,955.45	619.81	4,365.64	180
85.	WRWP-2 Warora	6,850.76	386.74	6,464.02	269
86.	WRWPL Warora	6,163.40	204.01	5,959.39	248
87.	WRH Chandrapur	23,936.75	835.39	23,101.36	962
88.	WRS Warora	24,907.88	611.67	24,296.21	1,012
89.	WRD Warora	21,092.37	1,409.08	19,683.29	820
90.	PR-1 Sironcha	13,034.91	260.43	12,774.48	532
91.	PR-2 Sironcha	15,625.16	38.89	15,586.27	649
92.	PR-3 Sironcha	13,340.05	21.38	13,318.67	554
93.	PR-4 Sironcha	30,741.73	132.19	30,609.54	1,275
94.	PR-5 Rajura	9,795.28	4.86	9,790.42	407
95.	I-4 Sironcha	12,831.44	Nil	12,831.44	534
96.	PR-6 Rajura	4,233.95	4.86	4,229.09	176
97.	PRD-1 Gadchiroli	10,993.92	4.86	10,989.06	457
98.	PRD-2 Sironcha	5,140.53	4.86	5,135.67	213
99.	PRD-3 Gadchiroli	20,241.15	Nil	20,241.15	843
100.	PRDW Gadchiroli	16,516.80	Nil	16,516.80	688

Continued

(1)	(2)	(3)	(4)	(5)	(6)
101.	PRDP Gadchiroli	10,540.56	Nil	10,540.56	439
102.	PRDC Gadchiroli	9,055.48	Nil	9,055.48	377
103.	PRT Sironcha	17,929.90	Nil	17,929.90	747
104.	PRD-1 Sironcha	22,417.68	522.96	21,894.72	912
105.	PRM-1 Gadchiroli	19,618.74	107.49	19,511.25	812
106.	PRJ Rajura	4,235.74	19.00	4,216.74	175
107.	I-1 Sironcha	18,261.83	Nil	18,261.93	761
108.	I-2 Sironcha	13,684.20	Nil	13,684.20	570
109.	I-3 Sironcha	7,625.91	Nil	7,625.91	317
110.	I-5 Sironcha	41,768.06	Nil	41,768.06	1,740
111.	I-6 Sironcha	11,067.84	Nil	11,067.84	461
112.	IV-1 Sironcha	14,814.57	Nil	14,814.57	617
113.	IV-2 Sironcha	6,595.34	Nil	6,595.35	274
114.	IVP Sironcha	16,264.28	21.38	16,242.90	676
115.	IB-1 Sironcha	13,285.58	4.86	13,280.72	553
116.	IB-2 Sironcha	14,014.80	19.45	13,995.35	578
117.	IB-3 Sironcha	13,219.20	42.76	13,175.40	548
118.	IB-4 Sironcha	5,982.27	34.03	5,948.24	247
119.	IB-5 Sironcha	9,321.74	123.31	9,198.43	383
120.	IBP-1 Sironcha	12,192.77	Nil	12,192.77	508
121.	IBP-2 Sironcha	21,600.43	Nil	21,600.43	900
122.	IBA Sironcha	12,297.07	104.65	1,219.42	508
123.	IBAD Sironcha	7,136.06	48.62	7,087.44	295

Continued

(1)	(2)	(3)	(4)	(5)	(6)
124.	IBJ'-1 Sironcha	20,424.60	160.45	20,264.15	844
125.	IBJ-2 Sironcha	15,827.04	40.62	15,770.72	657
126.	IBJ-1 Sironcha	19,982.33	53.48	19,928.85	826
127.	IBK Sironcha	15,204.50	83.93	15,120.57	630
	IBK				
	Gadchiroli				
128.	IBP' Gadchiroli	17,905.30	136.14	17,769.18	740
	IBP'				
	Sironcha				
129.	IBPO Gadchiroli	11,488.02	197.03	11,290.99	470
130.	IP-1 Sironcha	9,707.38	35.31	9,672.07	403
131.	IP-2 Sironcha	8,052.30	Nil	8,052.30	335
132.	IP-3 Sironcha	6843.92	Nil	6843.92	225
133.	IP-4 Sironcha	4,354.56	11.00	4353.56	180
134.	IPN Sironcha	7,031.17	19.45	7,011.72	292
135.	IPNR Sironcha	11,182.14	Nil	11,182.14	465
136.	PPNL Sironcha	18,218.76	19.45	18,199.31	758
137.	SE Gadchiroli	6,482.94	304.39	6,130.55	257
138.	PG-1 Rajura	18,413.45	96.14	18,317.31	763
139.	PG-2 Rajura	19,497.24	340.80	19,156.44	798
140.	GV-1 Sironcha	9,160.94	1,048.65	8,112.29	338
141.	GV-2 Sironcha	10,289.65	259.73	10,029.92	418
Grand Total		18,18,416.57	33,089.98	17,85,326.53	74,167

Appendix 2.28

TEHSILWISE LAND USE PATTERN IN CHANDRAPUR, 1974-75

Item	Name of tehsil						District
	Chan- drapur	Warora	Brhma- puri	Gadchi- roli	Siron- cha	Rajura	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total geographical area	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Area under forestry	39.95	28.94	45.44	64.56	77.13	9.44	55.12
Area under pasture	6.15	6.71	8.20	8.74	5.10	3.58	6.68
Land under tree crops and groves	1.28	0.69	0.34	0.39	0.09	2.90	0.61
Cultivated waste land	3.77	1.99	3.87	4.98	1.52	10.73	3.66
Other fallow lands	1.19	0.75	0.69	0.93	0.44	2.34	0.86
Current fallows	0.56	0.60	0.50	1.30	0.30	2.65	0.82
Net sown area	38.97	53.93	32.03	13.60	6.90	56.82	24.67
Area not available	8.13	6.39	8.93	5.50	8.52	11.54	7.58

Appendix 2.29

GROWTH IN AREA UNDER VARIOUS CROPS IN CHANDRAPUR

(in '000 hectares)

<i>Crop</i>	<i>1968-69</i>	<i>1969-70</i>	<i>1970-71</i>	<i>1971-72</i>	<i>1972-73</i>	<i>1973-74</i>	<i>1974-75</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paddy	229.35	228.84	231.04	230.31	226.44	232.84	197.50
Wheat	37.78	37.78	34.24	35.27	36.70	40.71	32.26
Jowar	34.89	35.34	37.85	49.04	66.11	31.30	54.85
(Kharif)							
Jowar	181.98	178.64	177.20	170.51	148.33	162.86	144.19
(Rabi)							
Jowar	216.86	213.97	215.05	219.55	214.14	194.15	199.04
Total							
Bajra	0.04	0.06	0.12	0.08	0.09	0.16	0.17
Other	7.04	6.90	8.13	6.77	6.63	7.46	8.29
cereals							
Total	491.11	487.57	488.59	492.00	483.27	475.32	440.26
cereals							
Gram	10.66	11.06	10.88	12.17	12.67	13.06	14.86
Tur	11.72	11.89	10.16	12.53	13.46	12.34	11.30
Lac	28.53	30.48	33.25	33.41	25.31	27.93	27.71
Other	50.24	53.41	42.17	44.97	43.53	48.86	45.14
pulses							
Total	101.13	106.85	96.46	103.09	94.97	102.18	99.01
pulses							
Total	592.20	594.42	585.05	595.07	578.24	577.51	539.27
foodgrains							
Sugarcane	0.22	0.21	0.16	0.13	0.13	0.14	0.08
Condi-	12.14	12.48	11.66	12.13	11.28	12.21	12.20
ments and							
spices							
Fruits and	2.09	2.23	1.73	1.92	1.89	2.05	2.25
vegetables							
Misc. food	0.11	0.18	0.12	0.28	0.73	0.59	0.38
crops							
Total food	606.81	609.53	598.72	609.54	592.26	592.46	554.19
crops							
Cotton	34.31	36.20	41.28	40.96	41.91	41.28	42.56
Other fibres	0.85	0.61	0.55	0.75	0.53	0.55	0.81
Total fibres	35.16	30.80	41.83	41.71	42.44	41.83	43.37

Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Groundnut	0.17	0.22	0.28	0.26	0.26	0.34	0.22
Seasamum	50.46	49.48	34.28	43.42	48.29	50.72	57.66
Linseed	16.91	17.47	25.41	22.88	25.17	30.67	33.85
Other oil-seeds	0.30	0.34	0.27	0.21	0.25	0.37	0.67
Total oil-seeds	67.85	67.52	60.24	66.77	73.97	82.10	92.39
Tobacco	0.32	0.33	0.50	0.17	0.12	0.05	0.04
Other drugs and narcotics	—	—	—	0.41	0.33	0.40	0.54
Total drugs and narcotics	—	0.33	0.41	0.58	0.45	0.51	0.58
Misc. non-food crops	—	0.94	0.97	1.24	1.17	1.19	1.15
Total non-food crops	104.21	105.59	103.45	110.03	118.03	125.62	137.49

Appendix 2.30

YIELD OF PRINCIPAL CROPS IN CHANDRAPUR

(kg./hec.)

<i>Crop</i>	1968- 69	1969- 70	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rice	923	1,065	1,104	913	442	1,224	660
Wheat	386	439	432	567	401	449	648
Jowar	480	491	169	291	400	438	458
Bajra	—	—	—	—	—	500	500
Maize	331	380	759	483	276	275	354
Other cereals	295	328	295	286	297	323	341
Total cereals	677	754	635	600	418	822	556
Gram	460	344	402	428	323	313	463
Tur	512	530	496	586	496	447	469
Other pulses	189	290	170	185	209	202	273
Total pulses	255	322	231	257	265	247	320
Sugarcane (in terms of gur)	7,600	8,100	8,000	6,000	6,000	7,000	7,000
Cotton (in terms of 100 bales)	96	97	44	79	109	59	98
Groundnut	588	450	500	500	333	600	500
Seasamum	157	168	150	223	248	150	210
Rap and Mustard	—	—	—	1,000	—	—	—
Linseed	231	212	234	266	179	185	192
Castor seed	429	459	500	500	1,000	500	400
Tobacco	617	599	500	500	750	600	600
Chillies	499	442	336	347	500	438	421
Turmeric	—	—	—	187	1,400	1,600	1,400

Appendix 2.31

PERCENTAGE DISTRIBUTION OF CULTIVATED AREA BY SIZE OF
HOLDING IN CHANDRAPUR

[illegible]

GROWTH OF LIVESTOCK POPULATION

Name of tehsil		Cattle				Males over 3 years
		Males over 3 years	Females over 3 years	Young stock	Total cattle	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	1961	77,432	42,288	40,547	1,60,267	7,341
	1971	78,325	50,348	49,928	1,78,601	4,531
Warora	1961	30,173	51,661	51,361	1,83,195	696
	1971	80,711	59,044	59,341	1,99,096	479
Brahmapuri	1961	66,738	32,736	32,672	1,32,146	3,528
	1971	71,469	37,463	34,377	1,43,309	2,105
Gadchiroli	1961	98,775	68,584	72,147	2,39,506	2,311
	1971	1,17,182	78,876	82,165	2,78,220	19,968
Sironcha	1961	40,766	41,680	43,082	1,25,528	10,566
	1971	57,607	56,880	60,403	1,74,890	12,732
Rajura	1961	35,340	24,826	16,599	76,765	188
	1971	40,288	34,161	30,637	1,05,096	357
District	1961	3,99,224	2,61,775	2,56,408	9,17,407	45,430
	1971	4,45,579	3,16,772	3,16,851	10,79,202	40,172

SOURCE: Socio-Economic Review and District Statistical Abstract of Chandrapur, Government of Maharashtra, Bombay.

2.32

IN CHANDRAPUR, 1961 AND 1971

<i>Buffalows</i>			<i>Sheep</i>	<i>Goats</i>	<i>Others</i>	<i>Total livestock</i>	<i>Total poultry</i>
<i>Female over 3 years</i>	<i>Young stock</i>	<i>Total buffalows</i>					
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
10,628	10,467	28,436	11,054	30,540	37	2,31,427	1,68,597
13,525	12,067	30,123	20,877	39,296	2,637	2,71,534	1,47,974
8,252	7,816	16,764	4,939	40,360	260	2,46,227	1,41,858
10,012	8,793	19,284	4,229	53,862	1,378	2,77,849	1,34,047
5,520	5,735	14,783	7,681	26,316	53	1,81,419	1,05,307
7,022	5,348	14,475	8,845	29,343	1,319	1,97,291	1,18,948
6,205	6,769	36,085	8,714	64,635	66	3,54,222	2,66,719
8,258	7,380	35,605	5,563	73,643	6,039	3,99,071	2,66,753
3,347	3,288	17,201	3,527	34,529	19	1,86,930	85,415
3,877	4,055	20,664	4,115	34,714	2,290	2,36,673	85,074
5,947	3,814	9,949	1,955	18,933	51	1,07,787	50,648
7,679	6,606	14,642	4,980	33,242	470	1,58,420	77,233
39,899	37,889	1,23,218	37,866	2,15,313	485	13,08,012	8,18,544
50,373	44,249	1,34,794	48,609	2,64,100	14,133	15,40,838	8,30,029

District, 1962-63, 1963-64 and 1975-76, Bureau of Economics and Statistics,

Appendix 2.33

GROWTH OF MAJOR FOREST PRODUCTS IN CHANDRAPUR

Divisions	Timber						Firewood				
	1971-72	1972-73	1973-74	1974-75	1975-76	1971-72	1972-73	1973-74	1974-75	1975-76	
	Cubic Mt.	C.M.	C.M.	C.M.	C.M.	Metric T.	M.T.	M.T.	M.T.	M.T.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
East Chanda	4,664	8,478	7,450	3,506	5,430	1,02,711	1,57,792	1,33,459	75,924	91,077	
West Chanda	5,614	7,668	4,255	4,485	4,260	51,632	17,489	18,475	15,606	26,047	
Central Chanda	10,692	53,748	10,768	5,573	3,111	23,277	20,094	16,584	18,877	28,933	
South Chanda	20,910	25,264	33,971	23,639	19,373	7,943	12,744	4,842	26,037	9,085	
Allapalli	19,285	19,395	48,320	40,325	36,444	25,062	8,878	7,033	26,548	33,357	
Bhamragarh	1,621	5,822	6,266	5,927	3,435	11,124	8,056	5,652	7,585	24,793	
District	62,786	1,20,375	1,11,030	83,455	72,053	2,21,749	2,25,053	1,86,045	1,70,577	2,13,297	

Continued

Division	Tendu leaves				Bamboo			
	1971-72 Standard bag	1972-73 S.B.	1973-74 S.B.	1974-75 S.B.	1975-76 S.B.	1973-74 Nos.	1974-75 Nos.	1975-76 Nos.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
East Chanda	1,06,070	1,03,379	67,474	84,979	83,885	2,01,33,100	2,21,00,000	2,40,09,977
West Chanda	50,897	53,064	29,782	48,012	36,938	24,70,000	14,95,000	64,06,600
Central Chanda	21,548	16,894	10,429	20,498	12,980	25,74,000	1,56,000	8,40,230
South Chanda	47,222	42,864	26,181	27,609	18,742	1,01,47,800	1,65,82,800	3,07,869
Allanalli	34,382	49,462	34,535	36,834	34,494	80,21,000	1,03,98,700	87,86,700
Bhamragarh	44,370	51,609	32,474	37,294	40,390	3,65,33,900	3,38,00,000	6,39,600
District	3,04,489	3,17,272	2,00,875	2,55,226	2,27,429	7,98,79,800	8,59,36,500	1,93,90,97

Unit: Standard bag (one bag contains nearly 70,000 leaves). Number of leaves may vary depending upon the size of leaves.
One Metric Tonne=1,300 number.

*Appendix 2.34*BLOCKWISE DISTRIBUTION OF MEDICAL FACILITIES IN
CHANDRAPUR 1975

<i>District/tehsil/block</i>	<i>No. of hospitals</i>	<i>No. of dispensaries</i>	<i>No. of maternity homes</i>	<i>No. of primary health centers</i>	<i>No. of family planning centres</i>
(1)	(2)	(3)	(4)	(5)	(6)
Chandrapur	2	11	1	1	2
Mul	—	9	1	1	1
Gondpipri	—	4	1	1	1
Total Chandrapur Tehsil	2	24	3	3	4
Warora	2	7	1	1	1
Chimur	—	5	1	1	1
Bhadrawati	—	5	1	1	1
Total Warora Tehsil	2	17	3	3	3
Brahmapuri	—	4	1	1	1
Sindewahi	—	4	1	1	1
Naghibid	—	3	1	1	1
Total Brahmapuri Tehsil	—	11	3	3	3
Gadchiroli	—	3	1	1	1
Dhanora	—	3	—	1	1
Kurkheda	—	2	—	1	1
Armor	—	3	—	1	1
Chamorshi	—	7	—	1	1
Total Gadchiroli Tehsil	—	18	1	5	5
Sironcha	—	4	1	1	1
Aheri	—	2	—	1	1
Yetapalli	—	2	—	1	1
Total Sironcha Tehsil	—	8	1	3	3
Rajura	—	6	—	1	1
Total Rajura Tehsil	—	6	—	1	1
District	4	84	11	18	19

SOURCE: Socio-Economic Review, District Statistical Abstract of Chandrapur District, 1974-75.

Appendix 3.1

DEPOSITS AND ADVANCES OF SCHEDULED COMMERCIAL BANKS
(ALL OFFICES) AS ON THE LAST FRIDAY OF DECEMBER

(Amount in lakhs of Rs.)

State/district centre	No. of offices	Deposits	Advances	Ratio
(1)	(2)	(3)	(4)	(5)
1972				
All India	15,247	9,15,906	6,37,585	69.61
Madhya Pradesh	750	25,897	11,815	45.62
Bastar District	15	240	33	13.75
Jagdalpur Town	3	132	29	—
Others	12	102	4	—
Maharashtra	1,858	2,06,887	1,68,044	81.22
Chandrapur District	24	476	496	104.20
Ballarpur Town	2	49	144	—
Brahmapuri Town	2	23	5	—
Chandrapur Town	5	295	319	—
Warora Town	2	60	11	—
Others	13	49	15	—
1973				
All India	16,816	10,75,526	8,06,527	74.99
Madhya Pradesh	819	29,714	18,570	62.50
Bastar District	16	372	44	11.83
Jagdalpur Town	3	162	38	—
Others	13	210	6	—
Maharashtra	1,999	2,38,510	2,12,645	89.15
Chandrapur District	26	692	663	95.81
Ballarpur Town	2	72	274	—
Brahmapuri Town	2	28	9	—
Chandrapur Town	6	399	346	—
Warora Town	2	86	9	—
Others	14	107	25	—
1974				
All India	17,938	11,61,053	8,24,541	71.02
Madhya Pradesh	878	31,566	19,666	62.22
Bastar District	19	365	44	12.05
Jagdalpur Town	3	195	38	—
Others	16	170	6	—
Maharashtra	2,122	2,51,378	2,20,869	87.86
Chandrapur District	29	861	741	86.06
Ballarpur Town	3	90	253	—
Brahmapuri Town	2	31	12	—
Chandrapur Town	7	506	411	—
Warora Town	3	98	35	—
Others	14	136	30	—

Continued

	(1)	(2)	(3)	(4)	(5)
<i>1975</i>					
All India		20,050	13,71,073	10,07,345	73.47
Madhya Pradesh		985	39,417	19,717	50.02
Bastar District		21	417	50	11.99
Jagdalpur Town		4	205	36	—
Others		17	212	18	—
Maharashtra		2,298	2,97,298	2,47,059	85.99
Chandrapur District		31	989	618	62.49
Ballarpur Town		4	87	169	—
Brahmapuri Town		2	41	15	—
Chandrapur Town		7	567	359	—
Warora Town		3	108	20	—
Others		15	186	55	—
<i>1976</i>					
All India		23,485	17,60,738	13,55,180	76.97
Madhya Pradesh		1,176	53,180	27,016	50.80
Bastar District		22	526	81	15.40
Jagdalpur Town		5	256	51	—
Others		17	270	30	—
Maharashtra		2,554	3,67,151	3,02,900	82.50
Chandrapur District		40	1,364	776	56.89
Ballarpur Town		5	167	197	—
Brahmapuri Town		2	51	25	—
Chandrapur Town		3	725	419	—
Warora Town		4	515	33	—
Others		21	266	102	—

SOURCE: Banking Statistics, Basic Statistical Returns, Reserve Bank of India.

Appendix 3.2

DISTRIBUTION OF DEPOSITS AND ADVANCES OF SCHEDULED COMMERCIAL BANKS (ALL OFFICES) OVER RURAL AND URBAN CENTRES (AS ON THE LAST FRIDAY OF DECEMBER, 1976)

Appendix 3.3

SECTORAL BREAKDOWN OF OUTSTANDING CREDIT OF SCHEDULED COMMERCIAL BANKS
AS ON THE LAST FRIDAY OF JUNE, 1976

Occupation District	(in '000 Rs.)									
	Total bank credit			Credit per account	Credits to agricultural and allied activities					
	No. of accounts	Amount			Total	Agriculture excluding plantations			Plantations	
		No. of accounts	Amount			No. of accounts	Amount	No. of accounts	Amount	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
All India	83,16,944	11,67,83,100	14.09	34,28,582	1,21,42,200 (10.4)	34,12,865	1,06,33,800 (9.1)	15,717	15,08,400 (1.3)	
Madhya Pradesh	2,48,715	22,79,043	9.16	1,24,322	4,79,090 (21.0)	1,24,322	4,79,090 (21.0)	—	—	
Bastar District	1,975	8,474	4.29	288	930 (10.97)	288	930 (10.97)	—	—	
Maharashtra	6,84,348	2,33,81,837	39.17	2,18,692	14,54,924 (6.2)	2,17,952	14,34,735 (6.1)	740	20,189 (0.1)	
Chandrapur District	7,713	82,695	10.72	2,565	4,566 (5.52)	2,565	4,566 (5.52)	—	—	

Continued

Occupation District	Credit to industry			Electricity		Credit to other sectors	
	No. of accounts	Amount	Small scale industries No. of accounts Amount	No. of accounts	Amount	No. of accounts	Amount
	(11)	(12)	(13) (14)	(15)	(16)	(17)	(18)
All India	7,80,022 (54.6)	6,37,71,300 (54.6)	2,88,220 (10.7)	1,608	9,72,200 (0.8)	41,08,340	4,08,69,600 (35.0)
Madhya Pradesh	27,131	12,80,418 (56.2)	9,437 (14.6)	46	6,069 (0.3)	97,262	5,19,535 (22.8)
Bastar District	215	3,906 (46.09)	63 (36.26)	—	—	1,472	3,638 (42.94)
Maharashtra	1,23,322	1,60,22,754 (68.5)	48,275 (10.7)	396	2,21,554 (0.9)	3,42,334	59,04,159 (25.23)
Chandrapur	902	67,050 (81.08)	294	—	—	4,246	11,079 (13.40)

Appendix 3.4

DEPOSITS AND LOANS OF CENTRAL COOPERATIVE BANKS (JUNE 1976)

(Amount in thousand of Rs.)

State/sub-district	No. of offices	Deposits	Advanced		Recovered		Outstanding		Advance-Deposit
			Short	Medium	Short	Medium	Short	Medium	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
India	5,477	98,49,171	1,02,86,800	14,62,801	94,02,087	12,58,863	88,28,014	35,19,092	119
Madhya Pradesh	661	5,11,980	7,37,039	30,697	6,86,233	80,097	7,99,860	1,70,402	149
Bastar District	16	5,896	4,552	1,376	3,288	1,674	8,786	1,825	100
Maharashtra	1,231	24,75,262	14,32,588	3,57,910	15,15,866	2,50,581	13,44,984	6,34,314	72
Chandrapur District	39	50,890	38,228	9,596	32,651	3,854	27,270	12,562	93

Appendix 3.5

FINANCIAL TRENDS OF THE DISTRICT CENTRAL COOPERATIVE BANK OF CHANDRAPUR

(Rs. in lakh)

Years	Paid up share capital	Reserve and other funds	Deposits	Working capital	Recovery	Loan outstanding	Borrowing	Advances
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1973-74	64.16	27.24	303.69	505.75	193.27	378.19	89.59	336.27
1974-75	69.23	30.69	418.23	585.50	285.66	420.09	38.93	331.48
1975-76	76.51	34.32	508.90	729.02	347.92	536.44	80.62	457.67
1976-77	88.63	38.01	545.73	627.46	295.69	638.13	68.79	464.63
1977-78	97.35	42.93	565.28	1,000.25	159.63	672.15	353.18	230.29

Appendix 3.6

EVALUATION OF THE CREDIT PLAN FOR BASTAR (PERFORMANCE UPTO DECEMBER, 1977)

(Rs. in thousand)

Name of bank	Agriculture		Industries		Services		Under other schemes not included in credit plan		Total		C/D ratio
	Commitment	Achievement	Commitment	Achievement	Commitment	Achievement	Commitment	Achievement	Commitment	Achievement	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
State Bank of India	12,129	2,123	3,033	115	3,119	1,310	528	18,281	4,076	16.7%	
Central Bank of India	1,011	108	334	2	206	149	48	1,551	307		
Union Bank of India	—	57	1,200	44	1,207	610	545	2,407	1,256		
Bank of Baroda	800	20	100	31	500	609	135	1,400	795		
Punjab National Bank	700	40	500	1	200	12	31	1,400	84		
Dena Bank	1,000	71	178	—	250	65	—	1,428	136		
Canara Bank	200	—	50	—	50	—	—	300	—		
Central Cooperative Bank Ltd.	11,000	15,993	—	—	—	—	—	11,000	15,993		
Cooperative Land Dev. Bank	10,000	2,762	—	—	—	—	13	10,000	2,775		
United Commercial Bank	400	—	—	—	100	—	—	500	—		
Total	37,240	21,174	5,395	193	5,632	2,755	1,300	48,267	25,422	14.96%	
Estimated credit demand as per credit plan	91,466		3,694		3,527			98,687			
				Percentage of achievement:	52.69%						
				PERFORMANCE UPTO JUNE, 1978							
State Bank of India	12,129	2,788	3,033	927	3,119	2,831	—	18,281	6,546	13.39%	

BANKWISE PROGRESS IN THE IMPLEMENTATION OF CHANDRAPUR

Name of the bank	Year	Agriculture			Small
		Share	Achievement	Achievement percentage	Share
(1)	(2)	(3)	(4)	(5)	(6)
Bank of India	1977	45.35	9.20	25.28	1.19
	1978	41.70	10.35	24.82	8.73
State Bank of India	1977	28.92	4.28	14.80	1.74
	1978	28.15	54.44	193.33	2.25
Bank of Maharashtra	1977	43.22	10.30	23.83	1.16
	1978	49.93	5.80	11.61	3.47
Bank of Baroda	1977	4.32	0.87	20.13	0.50
	1978	3.95	2.13	53.92	1.10
Allahabad Bank	1977	2.32	0.09	3.87	—
	1978	2.45	0.69	28.16	0.25
United Commercial Bank	1977	1.41	0.78	55.31	0.45
	1978	1.72	1.63	94.77	—
Punjab National Bank	1977	1.91	0.05	2.61	—
	1978	2.73	—	—	0.33
State Bank of Hyderabad	1977	—	—	—	—
	1978	—	—	—	—
United Western Bank Ltd.	1977	—	1.51	—	—
	1978	—	2.12	—	—
Indian Bank	1978	—	0.26	—	—
Union Bank of India	1978	—	—	—	—
Oriental Bank of Commerce Ltd.	1977	—	0.46	—	—
	1978	—	—	—	—
		258.08	104.96	40.67	21.17

3.7

DISTRICT CREDIT PLAN FOR THE YEARS 1977 AND 1978

<i>scale industries</i>		<i>Services</i>			<i>Total</i>		
<i>Achievement</i>	<i>Achievement percentage</i>	<i>Share</i>	<i>Achievement</i>	<i>Achievement percentage</i>	<i>Share</i>	<i>Achievement</i>	<i>Achievement percentage</i>
(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.80	235.19	13.04	12.24	93.86	59.58	24.24	37.98
2.11	24.17	8.54	12.88	250.58	58.97	25.34	42.98
2.93	168.39	7.79	7.66	98.33	38.45	14.87	38.67
12.25	544.44	5.68	34.58	608.80	36.08	101.27	280.68
10.90	939.65	9.91	21.65	218.47	54.29	42.85	78.92
7.03	202.59	6.24	18.04	289.10	59.64	30.87	51.76
5.82	1,164.00	1.05	6.13	583.81	5.87	12.82	218.40
3.72	338.18	0.88	10.99	1,248.86	5.93	16.84	283.98
—	—	1.05	0.08	7.62	3.37	0.17	5.04
0.09	36.00	0.88	0.35	39.77	3.58	1.13	31.56
2.31	513.33	0.52	2.48	467.31	2.38	5.52	231.93
2.67	—	0.45	8.03	1,784.44	2.17	12.33	568.20
3.00	—	0.53	—	—	2.44	3.05	125.00
0.50	151.51	0.44	1.27	288.64	3.50	1.77	50.57
—	—	—	—	—	3.00	—	—
—	—	—	—	—	3.00	—	—
5.08	—	—	—	0.99	—	6.59	—
5.10	—	—	—	4.13	—	7.22	—
—	—	—	0.30	—	—	0.56	—
0.11	—	—	1.64	—	—	1.75	—
—	—	—	1.26	—	—	1.72	—
—	—	—	—	—	—	—	—
66.42	313.74	57.00	139.53	244.79	342.25	310.91	90.84

BLOCKWISE GROWTH OF NUMBER OF UNITS UNDER DIFFERENT
1972-73 TO

Name of block	Number of agricultural pump sets		Annual rate of increase (%)	No. of industries		Annual rate of increase (%)
	1972-73	1976-77		1972-73	1976-77	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jagdalpur Tehsil						
Jagdalpur	35	48	9.28	10	18	20.00
Bastar	42	71	17.26	5	6	5.00
Bakawand	3	4	8.33	—	—	—
Tokapal	15	24	15.00	—	—	—
Lohandiguda	—	7	—	—	1	—
Darbha	—	—Not Electrified—		—	1	—
Bastanar	—	1	—	—	1	—
Dantewada Tehsil						
Dantewada	7	22	53.57	4	9	31.25
Geedam	—	13	—	2	4	25.00
Kuakonda	—	4	—	—	—	—
Katekalyan	—	—Not Electrified—		—	—	—
Konta Tehsil						
Chhindgarh	—	—	—	—	—	—
Sukma	—	6	—	—	1	—
Konta	—	9	—	1	2	12.5
Bijapur Tehsil						
Bijapur	}	—Not Electrified—				
Bhairamgarh						
Bhopalpatnam						
Usoor						
Kondagaon Tehsil						
Kondagaon	33	49	12.12	47	26	20.19
Keshkal	2	3	12.50	5	6	5.00
Pharasgaon	}	—Not Electrified—				
Makdi						
Baderajpur						
Narayanpur Tehsil						
Narayanpur	9	36	75.00	10	12	5.00
Antagarh	}	—Not Electrified—				
Koilibeda						
Abujhmar						
Kanker Tehsil						
Kanker	69	92	8.33	8	8	—
Charama	72	80	2.78	15	14	1.79
Sarona	26	51	24.04	3	3	—
Bhanupratappur Tehsil						
Bhanupratappur	33	36	2.27	8	13	15.63
Durgakondal	11	15	9.09	6	15	137.50

SOURCE: MPEB, Jagdalpur.

4.1

CATEGORIES OF ELECTRICITY CONSUMPTION IN BASTAR,
1976-77

<i>Domestic and commercial</i>		<i>Annual rate of increase (%)</i>	<i>Street lighting</i>		<i>Annual rate of increase (%)</i>
<i>1972-73</i>	<i>1976-77</i>		<i>1972-73</i>	<i>1976-77</i>	
(8)	(9)	(10)	(11)	(12)	(13)
365	540	11.99	9	38	80.55
154	279	20.29	18	53	48.61
10	71	152.50	—	26	—
3	87	700.00	—	15	—
—	140	—	—	20	—
—	2	—Not Electrified—	—	—	—
139	302	22.48	20	69	62.50
124	213	17.94	20	26	7.50
—	226	—	—	93	—
—	—	—Not Electrified—	—	—	—
—	37	—	—	53	—
—	200	—	—	88	—
51	244	75.00	—	17	—
—	—	—Not Electrified—	—	—	—
549	785	10.75	—	—	—
115	158	27.89	35	35	—
—	—	—Not Electrified—	—	—	—
120	316	18.89	36	36	—
—	—	—Not Electrified—	—	—	—
37	96	39.87	—	—	—
117	210	19.87	16	20	6.25
22	38	18.18	8	40	100.00
101	337	16.92	41	47	3.65
82	361	85.06	50	50	—

PROGRESS OF REC SCHEMES IN BASTAR

Sl. No.	Name of scheme	Category	Loan instalment taken before Sept., 1978	New villages electrified		H.T. lines (kms.)		L.T. lines (kms.)	
				T	A	T	A	T	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Jagdalpur	SU	2	62	52	150	125	182	103
2.	Konta-Dantewada	SU	3	42	30	40	116	183	94
3.	Bijapur	MNP	1	10	8	205	161	—	18
4.	Bakawand	„	1	6	1	49	23	14	10
5.	Bhanupratapur	„	1	4	1	31	62	7	9
6.	Konta	„	}	— New programmes			—		
7.	Narayanpur	„							
8.	Kondagaon	„							

T=Target A=Achievement

SOURCE: Rural Electrification Corporation, New Delhi.

4.2

AS ON SEPTEMBER, 1978

<i>Distribution transformer (KVA)</i>		<i>Pump sets (No.)</i>		<i>LT/Agro inisurries (No.)</i>		<i>Dom./Com. services</i>		<i>Street light points</i>		<i>Total No. of services</i>	
<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
2,802	1,342	138	46	60	2	1,140	669	450	136	1,838	848
2,002	2,384	225	24	20	1	320	726	160	390	725	1,145
750	489	—	—	—	1	—	451	—	146	—	598
188	113	10	—	—	—	23	37	14	15	47	52
138	63	7	—	—	1	20	129	11	—	32	130

— New programmes —

Appendix 4.3
REC SCHEMES SANCTIONED IN BASTAR AS ON MARCH, 1978

Sl. No.	RE scheme and date of sanction	No. of villages			No. of pump sets	No. of small industries	Domestic commercial	Street lights	Cost of scheme (Rs. in lakhs)	Amount of loan sanctioned	Classification
		N	E	Total							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Jagdalpur (30.6.1973)	115	—	115	750	120	2,300	900	53.840	51.770	SU
2.	Konta-Dantewada (23.2.1974)	39	—	39	450	40	400	200	27.550	26.500	SU
3.	Bijapur (25.1.1975)	120	—	120	400	30	500	100	111.270	86.300	MNP (T) ST
4.	Bakawand (30.7.77)	20	—	20	100	4	230	140	17.621	17.015	MNP
5.	Bhanupratappur (30.7.77)	15	—	15	70	3	200	110	10.810	10.340	MNP
6.	Konta (28.9.77)	19	—	19	36	2	80	100	17.812	17.595	MNP
7.	Narayanpur (2.12.1977)	12	—	12	26	2	50	50	20.696	20.649	MNP
8.	Kondagaon (2.12.1977)	88	—	88	300	25	500	400	68.460	67.09	MNP

SOURCE: Rural Electrification Corporation, New Delhi.

N=New E=Electrified

Appendix 4.4

VILLAGE ELECTRIFICATION IN BASTAR 1976-77

<i>Sl. No.</i>	<i>Name of block/tehsil</i>	<i>Inhabited villages</i>	<i>Villages electrified</i>	<i>Per cent of village electrification</i>
(1)	(2)	(3)	(4)	(5)
1.	Jagdalpur	111	29	26.13
2.	Bastar	110	26	23.64
3.	Bakawand	99	9	9.09
4.	Tokapal	70	12	17.14
5.	Lohandiguda	79	13	16.46
6.	Darbha	59	—	—
7.	Bastanar	42	1	2.38
Tehsil Jagdalpur		570	90	15.79
8.	Dantewada	64	7	10.94
9.	Geedam	72	5	6.94
10.	Kuakonda	54	5	9.26
11.	Katekalyan	43	—	—
Tehsil Dantewada		233	17	7.30
12.	Chhindgarh	77	2	2.60
13.	Sukma	54	5	9.26
14.	Konta	186	5	2.69
Tehsil Konta		317	12	3.79
15.	Bijapur	87	1	1.15
16.	Bhairamgarh	209	—	—
17.	Bhopalpatnam	127	—	—
18.	Usoor	95	—	—
Tehsil Bijapur		518	1	0.02
19.	Bade Rajpur	56	12	—
20.	Kondagaon	171	12	7.02
21.	Keshkal	104	2	1.92
22.	Makdi	97	—	—
23.	Pharasgaon	103	—	—
Tehsil Kondagaon		531	14	2.64

Continued

(1)	(2)	(3)	(4)	(5)
24.	Narayanpur	165	7	4.24
25.	Antagarh	150	—	—
26.	Koilibeda	153	—	—
27.	Abujhmar	158	—	—
Tehsil Narayanpur		626	7	1.12
28.	Kanker	104	26	25.00
29.	Charama	98	14	14.29
30.	Sarona	116	11	9.48
Tehsil Kanker		318	51	16.04
31.	Bhanupratappur	111	7	6.31
32.	Durgakona	141	3	2.13
Tehsil Bhanupratappur		252	10	3.97
District		3,365	202	6.00

Appendix 4.5

REC/MNP SCHEMES UNDER OPERATION IN BASTAR

Sl. No.	Name of REC/MNP scheme	Year of sanction	Scheme provision					
			Financing rupees in lakhs	Pumps	Industrial	Light & fan	Street light points	Village
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Jagdulpur Tehsil REC	Aug. 1973	51.87	750	120	2,800	900	115
2.	Konta Dantewada Tehsil REC	Mar. 1975	26.50+ 52.71 (Govt.)	450	140	400	200	39
3.	Bijapur Tehsil MNP	Oct. 1976	86.30	400	30	500	100	120
4.	Bastar and Bakawand MNP	Sept. 1977	17.05	100	4	230	140	20
5.	B'pur and Antagarh MNP	July. 1977	10.34	70	3	200	110	15
6.	Kondagaon Tehsil MNP	Nov. 1977	67.09	300	25	500	400	88
7.	Narainpur Orcha MNP	Sept. 1977	20.55	25	2	50	50	12
8.	Jagargunda BK.MNP	Sept. 1977	17.60	36	2	80	100	19
9.	Bastanar BK. MNP Scheme	Nov. 1978	5.97	18	3	40	40	10
10.	Koelibeda Antagarh Block MNP	Feb. 1979	22.77	36	3	125	85	36
Total			378.75	2,185	332	4,925	2,125	474

NOTE: Konta Dantewada Tehsil REC Scheme is revised under cost escalation provision. As per revised scheme it now, comprises: Village: 80, Amount: Rs. 46.16 lakh + Govt. Rs. 56.80 lakh, Pump: 203, L&F 2000, Industrial: 18.

*Appendix 4.6*BLOCKWISE GROWTH IN THE NUMBER OF ELECTRIFIED
VILLAGES IN BASTAR (CUMULATIVE)

<i>Block</i>	1969-70	70-71	71-72	72-73	73-74	74-75	75-76	76-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Jagdalpur	5	8	10	12	12	13	13	29
Bastar	5	8	8	11	15	19	19	26
Bakawand	1	1	1	3	3	3	3	9
Tokapal	—	—	—	5	5	6	8	12
Lohandiguda	—	—	—	—	—	5	6	13
Darbha	—	—	—Not Electrified—					
Bastanar	—	—	—	—	—	1	1	1
Dantewada	3	3	3	3	3	3	6	7
Geedam	1	1	1	1	2	2	3	5
Kuakonda	—	—	—	—	—	1	3	5
Katekalyan	—	—	—Not Electrified—					
Chhindigarh	—	—	—	—	—	—	1	2
Sukma	—	—	—	—	—	—	3	5
Konta	2	3	3	5	5	5	5	5
Bijapur	—	—	—	—	—	—	—	1
Bhairamgarh	—	—	—Not Electrified—					
Bhopalpatnam	—	—	—Not Electrified—					
Usoor	—	—	—Not Electrified—					
Bade Rajpur	—	—	—Not Electrified—					
Kondagaon	1	1	1	1	1	4	7	12
Keshkal	2	2	2	2	2	2	2	2
Makdi	—	—	—Not Electrified—					
Pharasgaon	—	—	—Not Electrified—					
Narayanpur	—	—	—Not Electrified—					
Antagarh	—	—	—Not Electrified—					
Koilibeda	—	—	—Not Electrified—					
Abujmar	—	—	—Not Electrified—					
Kanker	11	14	19	20	21	22	23	26
Charama	1	6	12	13	14	14	14	14
Sarona	1	5	5	6	10	11	11	11
Bhanupratappur	—	—	6	7	7	7	7	7
Durgakondal	—	—	1	3	3	3	3	3
District	34	53	75	96	107	126	132	202

Appendix 4.7

BLOCKWISE GROWTH IN THE NUMBER OF ELECTRIFIED
VILLAGES IN CHANDRAPUR

Block	1968-69	69-70	70-71	71-72	72-73	73-74	74-75	75-76	76-77
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Chandrapur	11	14	27	32	36	40	48	49	51
Mul	20	20	27	31	32	39	41	43	43
Gondpipri	21	21	26	26	28	30	37	37	37
Brahmapuri	20	20	30	32	36	42	47	47	48
Nagbhid	7	7	17	26	30	45	57	57	58
Sindewahi	9	10	21	26	27	28	33	36	36
Sironcha	1	1	7	10	19	25	32	32	32
Aheir	1	1	2	2	7	8	11	11	12
Yetapalli				—Not Electrified—					
Gadchiroli	3	3	5	10	11	14	19	19	19
Armori	9	9	15	20	22	25	27	27	27
Dhanora				—Not Electrified—					
Chamorshi	4	7	8	8	8	9	9	10	10
Kurkheda	1	1	1	7	9	12	12	13	13
Warora	28	34	58	60	60	62	67	69	72
Chirmur	7	11	23	24	25	27	30	32	34
Bhadrawati	4	5	12	13	18	22	23	24	24
Rajura	5	7	26	31	35	38	46	47	51
District	151	171	305	358	403	466	539	553	567

BLOCKWISE GROWTH IN NUMBER AND CONNECTED LOAD

Name of block	No. of agricultural pump sets		Annual rate of growth (%)	No. of industrial units		Annual rate of growth (%)
	1972-73	1976-77		1972-73	1976-77	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur Tehsil						
Chandrapur	84	218	38.88	78	118	12.82
Mul	52	90	18.27	63	116	21.03
Gondpipri	77	189	36.36	26	38	11.54
Warora Tehsil						
Warora	35	127	65.71	1	13	30.00
Bhadrawati	3	36	275.00	6	14	33.33
Chimur	41	141	60.98	9	30	58.33
Brahmapuri Tehsil						
Brahmapuri	126	249	24.41	36	63	18.75
Sindewahi	85	191	31.18	43	68	14.53
Nagbhid	83	294	63.56	46	69	12.50
Gadchiroli Tehsil						
Gadchiroli	2	16	175.00	20	40	45.00
Armori	46	81	19.02	33	57	18.18
Chamorshi	19	25	7.89	21	29	9.53
Dhanora	—	—	—	—	5	—
Kurkheda	2	25	287.50	9	18	25.00
Sironcha Tehsil						
Sironcha	3	3	—	6	3	8.33
Aheri	2	23	262.50	5	12	35.00
Yetapalli	—	—	—	—	—	—
Rajura Tehsil						
Rajura	64	209	56.44	55	77	10.00

4.8

UNDER DIFFERENT CATEGORIES IN CHANDRAPUR

No. of domestic and commercial connections		Annual rate of growth (%)	No. of street-lights		Annual rate of growth (%)
1972-73	1976-77		1972-73	1976-77	
(8)	(9)	(10)	(11)	(12)	(13)
1,551	2,471	14.84	14	22	14.28
971	1,384	10.63	950	1,158	5.47
235	486	26.70	77	85	2.59
11	111	24.77	70	254	65.71
10	32	55.00	10	50	100.00
11	108	220.45	117	273	33.33
747	1,461	23.89	281	540	23.04
790	1,255	14.72	687	907	8.01
568	1,190	27.38	558	829	12.14
450	731	15.61	279	425	13.08
588	1,348	32.31	227	377	16.52
210	332	14.52	197	245	6.09
—	44	—	—	75	—
133	265	24.81	170	272	15.00
227	333	11.68	205	214	1.09
203	318	14.16	112	161	10.94
—	—	—	—	—	—
724	1,100	12.98	20	32	15.00

*Appendix 4.9*PERCENTAGE OF VILLAGE ELECTRIFICATION TO TOTAL
INHABITED VILLAGES, 1976-77 IN CHANDRAPUR

<i>Name of block/tehsil</i>	<i>Inhabited villages</i>	<i>Villages electrified</i>	<i>Per cent of villages electrification</i>
(1)	(2)	(3)	(4)
Chandrapur	123	48	39.02
Mul	120	43	35.83
Gondpipri	145	37	25.52
Tehsil Chandrapur	388	128	32.99
Brahmapuri	107	48	54.21
Nagbhid	120	58	48.33
Sindewahi	115	36	31.30
Tehsil Brahmapuri	342	142	41.52
Sironcha	98	32	32.65
Aheri	179	12	6.70
Yetapalli	279	—	—
Tehsil Sironcha	556	44	7.91
Gadchiroli	103	20	19.42
Armori	119	31	26.05
Dhanora	259	3	1.16
Chamorshi	182	10	5.49
Kurkheda	197	13	6.60
Tehsil Gadchiroli	860	77	8.95
Warora	165	71	43.03
Chimur	151	34	21.52
Bhadrawati	129	24	18.60
Tehsil Warora	449	130	29.21
Rajura	249	47	18.88
Tehsil Rajura	249	47	18.88
District	2,840	567	19.96

Appendix 4.10

RURAL ELECTRIFICATION BUDGET AND EXPENDITURE
DURING 1975-77 IN CHANDRAPUR

Scheme	1975-76		1976-77		1977-78 (as on 31-3-78)	
	Budget provision	Expenditure (Rs. in lakhs)	Budget provision	Expenditure (Rs. in lakhs)	Budget provision	Expenditure (Rs. in lakhs)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Normal Development						
Tribal	12.00	17.02	13.99	14.86	3.00	3.17
Non-tribal	—	—	—	—	14.00	14.21
RE (P)						
Tribal	9.00	5.66	10.00	9.67	5.00	1.13
Non-tribal	—	—	—	—	1.00	1.65
REC						
Tribal	20.00	1.45	12.00	12.05	5.00	5.49
Non-tribal	—	—	—	—	35.00	26.39
Special Tribal	—	—	24.00	18.5	32.00	20.32
System Improvement	—	—	—	—	4.00	3.99

SOURCE: Executive Engineer (O & M) Division, MSEB, Chandrapur.

REC SCHEMES SANCTIONED IN CHANDRAPUR

<i>RE Scheme and date of sanction</i>	<i>No. of villages</i>			<i>No. of pump sets</i>	<i>No. of small industries</i>
	<i>N</i>	<i>E</i>	<i>Total</i>		
(1)	(2)	(3)	(4)	(5)	(6)
Chanda, Brahmapuri, Warora, Gadchiroli and Rajura (29-4-70)	91	—	91	1,300	175
Chanda, Warora, Brahmapuri, Gadchiroli and Rajura (29-12-71)	108	—	108	1,000	170
Warora (31-1-77)	98	41	139	480	45
Malgandpuri (31-1-77)	153	39	192	454	81
Gadchiroli (2-12-77)	—	—	—	—	—
Sironcha (7-12-77)	—	—	—	—	—

SOURCE: REC, New Delhi.

N=New E=Electrified

4.11

AS ON MARCH, 1978

Domestic commercial	Street lights	Cost of schemes	Amount of loan	Classi- fication of the area	Disbursement upto March '78	
					No. of instalments released	Amount (Rs. lakhs)
(7)	(8)	(9)	(10)	(11)	(12)	(13)
2,000	900	58.070	58.070	OB	4	54.521
1,900	1,015	71.097	68.284	OB	3	61.941
720	701	63.436	60.630	OB	—	—
1,762	870	77.560	73.333	OB	—	—
—	—	—	—	SU	—	—
—	—	—	—	SU	—	—

PROGRESS OF REC SCHEMES IN CHANDRAPUR

Name of scheme	Category	Loan instalment taken before Sept. '78	New villages electrified		H.T. lines (kms.)		L.T. lines		Distribution transformer (KVA)	
			T	A	T	A	T	A	T	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Chanda, Brahmapuri, Warora, Gadchiroli and Rajura (29-4-70)	OB	4	90	90	236	255	281	241	3,576	4,489
Chanda, Warora, Brahmapuri, Gadchiroli and Rajura (29-12-71)	OB	3	108	97	380	420	309	126	5,400	6,446
Warora (31-1-77)	OB	1	30	6	110	71	43	16	1,626	616
Mul-Gond-pipri (31-1-77)	OB	1	69	7	88	86	117	17	1,326	263
Gadchiroli (2-12-77)	SU		—	—	—	—	—	—	—	—
Sironcha (7-12-77)	SU		—	—	—	—	—	—	—	—

SOURCE: REC, New Delhi.

T=Target A=Achievement

*Appendix 4.13*VILLAGES ELECTRIFIED BLOCKWISE AND SCHEMewise
IN CHANDRAPUR UPTO 30.4.1977

<i>Tehsil</i>	<i>Block</i>	<i>Scheme</i>				<i>Total</i>
		<i>REC I</i>	<i>REC II</i>	<i>RE/ND</i>	<i>L.I.S.</i>	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chandrapur	Chandrapur	5	10	35	6	50
	Mul	9	6	28	3	43
	Gondpipri	5	9	23	1	37
	Total	19	25	86	10	130
Warora	Warora	15	9	48	3	72
	Bhandak	6	2	16	—	24
	Chimur	—	6	28	—	34
	Total	21	17	92	3	130
Brahmapuri	Brahmapuri	4	8	36	3	48
	Nagbhid	15	20	23	1	58
	Sindewahi	4	9	23	1	36
	Total	23	37	82	5	142
Gadchiroli	Gadchiroli	5	5	9	1	19
	Chamorishi	—	2	8	—	10
	Armor	2	2	24	—	28
	Kurkheda	10	—	3	—	13
	Dhanora	—	—	3	—	3
	Total	17	9	47	1	73
Sironcha	Sironcha	—	—	32	—	32
	Aheri	—	—	12	—	12
	Yetapalli	—	—	—	—	—
	Total	—	—	44	—	44
Rajura	Rajura	10	7	34	1	51
	Total	10	7	34	1	51
Grand Total		90	95	385	20	570

SOURCE: E.E., MSEB, Chandrapur.

L.I.S.=Lift Irrigation Scheme.

Appendix 5.1

REGISTERED EXISTING INDUSTRIAL UNITS IN BASTAR,
UP TO 31.3.79

<i>Type of industry</i>	<i>No. of units</i>
(1)	(2)
Cold Storage and ice plant	1
Agriculture products	77
Confessionary and food products	10
Food product oil pressing	4
Art silk fabrication	2
Tailoring workshop coop. society, textile	1
Wood working (power)	34
Wood working non-power	38
Soap (non-power)	5
Printing and binding	7
Rubber goods	1
Chemical industries	1
Lime and fire bricks	19
Utensil non-ferrous	4
Cement articles	2
Sheet metal ferrous	4
Engg. works	38
Rewinding and vulcansing	12
Leather goods	1
Miscellaneous industries	35
Total	296

Appendix 5.3
GROWTH PATTERNS OF SMALL SCALE INDUSTRIES IN CHANDRAPUR, 1978-79 TO 1982-83

Category	1978-79		1979-80		1980-81		1981-82		1982-83		Total	
	U	E	U	E	U	E	U	E	U	E	U	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Engineering	9	64	10	70	11	75	10	65	9	65	49	399
Chemical and plastic	2	80	1	15	1	12	—	—	2	15	6	122
Food and allied, dal, rice, poha	20	98	14	70	14	70	14	70	15	85	77	393
Leather, tanning bone mill, glue	1	7	2	49	—	—	—	—	2	10	5	65
Ceramics, bricks, tiles, glass, clay	10	230	9	195	12	265	12	265	13	290	56	1,245
Cement based units	4	20	4	40	3	15	4	20	6	30	21	105
Wood based	6	30	5	25	7	35	7	35	10	50	35	175
Handicraft, sericulture, coir fibre	16	31	28	34	27	31	28	34	33	65	132	195
Forest based	7	79	8	81	6	51	6	25	9	65	36	301
Misc (incl. service industry of educated unemployed)	123	510	124	386	116	305	121	305	130	365	614	1,871
Total	198	1,149	205	944	197	859	202	819	229	1,040	1,031	4,811

U= Unit E=Employment

Appendix 5.4

GROWTH PATTERN OF MEDIUM SCALE INDUSTRIES IN CHANDRAPUR, 1978-79 TO 1982-83

[illegible]

Appendix 5.5

PARTICULARS OF CATEGORYWISE CONNECTED LOAD IN CHANDRAPUR,
1978-79 (KW)

Category	1977-78		Total	1978-79		Total
	Urban	Rural		Urban	Rural	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Domestic	7,053.45	7,234.74	14,288.19	8,034.30	8,194.37	16,228.67
commercial						
Agricultural	1,118.98	8,320.41	9,439.39	1,195.31	9,397.01	10,592.32
and irrigation						
Industries	52,884.99	25,186.20	78,071.19	55,760.91	26,903.83	82,604.74
Street lighting	194.06	470.28	664.34	213.66	649.24	862.90
Total	61,151.48	31,211.63	92,463.11	65,143.18	35,044.45	1,00,187.63

FINANCIAL AND PHYSICAL TARGETS EXPECTED DURING

Name of scheme	Tribal						Non-	
	Financial target (Rs. in lakhs)	Villages	Ag. pump	I.P.	Single phase	Street light	Financial target (Rs. in lakhs)	Villages
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I. D.P.D.C. Schemes								
Normal Development	23.00	—	380	46	460	230	104.00	—
H.E. (Plan)	5.00	5	10	5	10	25	75.00	90
Tribal Sub-Plan	98.50	120	160	21	140	475	—	—
System Improvement	19.50	—	—	—	—	—	67.00	—
Total I	146.50	125	550	72	610	730	246.00	90
II. Non-Planned Scheme								
REC	244.00	510	1,366	192	4,276	3,499	139.00	336
Deposit works	—	—	—	—	—	—	48.00	—
Total II	244.00	510	1,366	192	4,276	3,499	187.00	336
III. State Level Schemes								
33 KV Project	149.50	—	—	—	—	—	30.00	—
Total I, II, III	539.50	635	1,916	264	4,886	4,229	463.00	426

5.6

SIXTH FIVE YEAR PLAN OF CHANDRAPUR (1978-83)

Tribal				Total					
Ag. pump	I.P.	Single phase	Street light	Financial target (Rs. in lakhs)	Villages	Ag. pump	I.P.	Single phase	Street light
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1,025	180	8,700	850	127.00	—	1,405	276	9,160	1,080
105	45	180	425	80.00	95	115	50	190	450
—	—	—	—	98.50	120	160	21	140	475
—	—	—	—	86.50	—	—	—	—	—
1,130	225	8,880	1,275	392.00	215	1,680	297	9,490	2,005
1,139	162	3,025	2,243	383.00	846	2,505	354	7,301	5,742
—	—	—	—	48.00	—	—	—	—	—
1,139	162	3,025	2,243	431.00	846	2,505	354	7,301	5,742
—	—	—	—	179.50	—	—	—	—	—
2,269	387	11,905	3,518	1,002.50	1,061	4,185	651	16,791	7,747

*Appendix 6.1***SUGGESTED SYSTEM OF GROWTH FOCI FOR BASTAR**

<i>Sl. No.</i>	<i>Name of Growth Foci</i>	<i>Name of block</i>	<i>Name of tehsil</i>
(1)	(2)	(3)	(4)
<i>I. Growth Centres</i>			
1.	Jagdalpur	Jagdalpur	Jagdalpur
2.	Kirandul/Bacheli (Bailadila Mining Area)	Kuakonda	Dantewada
<i>II. Growth Points</i>			
3.	Narayanpur	Narayanpur	Narayanpur
4.	Geedam	Geedam	Dantewada
5.	Barsur	Geedam	Dantewada
<i>III. Market Towns</i>			
6.	Konta	Konta	Konta
7.	Kanker	Kanker	Kanker
8.	Charama	Charama	Kanker
9.	Bhanupratappur	Bhanupratappur	Bhanupratappur
10.	Bijapur	Bijapur	Bijapur
11.	Keshkal	Keshkal	Kondagaon
12.	Kondagaon	Kondagaon	Kondagaon
<i>IV. Service Centres</i>			
13.	Dantewada	Dantewada	Dantewada
14.	Bhansi	Dantewada	Dantewada
15.	Pakhanjore	Koilibeda	Narayanpur
16.	Bhopalpatnam	Bhopalpatnam	Bijapur
17.	Antagarh	Antagarh	Narayanpur
18.	Sukma	Sukma	Konta
19.	Bhairamgarh	Bhairamgarh	Bijapur
20.	Pharasgaon	Pharasgaon	Kondagaon
21.	Bastar	Bastar	Jagdalpur
22.	Bakawand	Bakawand	Jagdalpur
23.	Sarona	Sarona	Kanker
24.	Koilibeda	Koilibeda	Narayanpur
25.	Kodenar	Dantewada	Dantewada
26.	Durgakondal	Durgakondal	Bhanupratappur
27.	Dahikonga	Kondagaon	Kondagaon
28.	Bishrampur	Bade Rajpur	Kondagaon
29.	Darbha	Darbha	Jagdalpur
30.	Badekilpal	Bastanar	Jagdalpur
31.	Chitlanka	Dantewada	Dantewada

Continued

(1)	(2)	(3)	(4)
32. Pharasgaon		Narayanpur	Narayanpur
33. Bastanar		Bastanar	Jagdalpur
34. Bade Dongar		Pharasgaon	Kondagaon
35. Usoor		Uscor	Bijapur
36. Bade Rajpur		Bade Rajpur	Kondagaon
37. Bade Dharpur		Lohandiguda	Jagdalpur
38. Orcha		Abujhmar	Narayanpur
39. Kuakonda		Kuakonda	Dantewada
40. Makdi		Makdi	Kondagaon
41. Tokapal		Tokapal	Jagdalpur
42. Katekalyan		Katekalyan	Dantewada
43. Chhindgarh		Chhindgarh	Konta
<i>V. Central Villages</i>			
44. Ilmidi		Usoor	Bijapur
45. Karanji		Kondagaon	Kondagaon
46. Kanharpur		Kanker	Kanker
47. Chhote Dongar		Abujhmar	Narayanpur
48. Amoda		Koilibeda	Narayanpur
49. Bhanpur		Bastar	Jagdalpur
50. Bajawand		Bakawand	Jagdalpur
51. Gitapahar		Kanker	Kanker
52. Dudhawa		Sarona	Kanker
53. Gangaloor		Bijapur	Bijapur
54. Madded		Bhopalpatnam	Bijapur
55. Leda		Chhindgarh	Konta
56. Kolchur		Bastar	Jagdalpur
57. Lanjoda		Pharasgaon	Kondagaon
58. Banujagaon		Kondagaon	Kondagaon
59. Dhanora		Keshkal	Kondagaon
60. Badaji		Bade Rajpur	Kondagaon
61. Asna		Jagdalpur	Jagdalpur
62. Lakhanpuri		Charama	Kanker
63. Bhandbeda		Bhanupratappur	Bhanupratappur
64. Benoor		Narayanpur	Narayanpur
65. Palnar		Kuakonda	Dantewada
66. Dashpur		Kanker	Kanker
67. Deori		Bastar	Kanker
68. Kudalgaon		Bastar	Jagdalpur
69. Kanhanpuri		Sarona	Kanker
70. Sonarpal		Bastar	Jagdalpur
71. Chhote Kapri		Koilibeda	Narayanpur
72. Sambalpur		Bhanupratappur	Bhanupratappur
73. Pandripani		Jagdalpur	Jagdalpur
74. Takaraguda		Lohandiguda	Jagdalpur
75. Bundeli		Sarona	Kanker
76. Kolar		Antagarh	Narayanpur

Continued

(1)	(2)	(3)	(4)
77. Balenga	Bastar	Jagdalpur	
78. Deori	Sarona	Kanker	
79. Karrajaisa	Charama	Kanker	
80. Jova	Kondagaon	Kondagaon	
81. Bhainsasur	Koilibeda	Narayanpur	
82. Jepra	Charama	Kanker	
83. Markatola	Sarona	Kanker	
84. Chinori	Charama	Kanker	
85. Khorkhasa	Bastar	Jagdalpur	
86. Dhurli	Dantewada	Dantewada	
87. Bade Bachel	Dantewada	Dantewada	
88. Awapalli	Usoor	Bijapur	
89. Balpet	Dantewada	Dantewada	
90. Haradula	Charama	Kanker	
91. Karra Naidu	Bhanupratappur	Bhanupratappur	
92. Kundalpal	Chhindgarh	Konta	
93. Bhond	Bastar	Jagdalpur	
94. Arakot	Tokapal	Jagdalpur	
95. Gadiras	Sukma	Konta	
96. Basaguda	Usoor	Bijapur	
97. Nagarnar	Jagdalpur	Jagdalpur	
98. Bade Kapri	Koilibeda	Narayanpur	
99. Charbhatthi	Kanker	Kanker	
100. Pipra	Keshkal	Kondagaon	
101. Jagargunda	Konta	Konta	
102. Sandra	Bhopalpatnam	Bhanupratappur	
103. Rajpur	Bastar	Jagdalpur	
104. Metapal	Dantewada	Dantewada	
105. Tongapal	Chhindgarh	Konta	
106. Errabor	Konta	Konta	
107. Patand	Kanker	Kanker	
108. Narharpur	Sarona	Kanker	
109. Raj Nagar	Bakawand	Jagdalpur	
110. Kukanar	Darbha	Jagdalpur	
111. Jaibel	Bakawand	Jagdalpur	
112. Jaitgiri	Bakawand	Jagdalpur	
113. Dilmili	Jagdalpur	Jagdalpur	
114. Chitrakot	Lohandiguda	Jagdalpur	

Appendix 6.2

SUGGESTED SYSTEM OF GROWTH FOCI FOR CHANDRAPUR

Sl. No.	Name of Growth Foci	Name of block	Name of tehsil
(1)	(2)	(3)	(4)
<i>I. Growth Centres</i>			
1.	Chandrapur	Chandrapur	Chandrapur
2.	Ballarpur	Chandrapur	Chandrapur
3.	Ghugus	Chandrapur	Chandrapur
4.	Ashti	Chamorshi	Gadchiroli
<i>II. Growth Points</i>			
5.	Warora	Warora	Warora
6.	Bhadrawati	Bhadrawati	Warora
7.	Surjgad	Yetapalli	Sironcha
8.	Desaiganj	Armori	Gadchiroli
9.	Wadsa	Armori	Gadchiroli
<i>III. Market Towns</i>			
10.	Sasti	Rajura	Rajura
11.	Mul	Mul	Mul
12.	Brahmapuri	Brahmapuri	Brahmapuri
13.	Nagbhid	Nagbhid	Brahmapuri
14.	Sindewahi	Sindewahi	Sindewahi
15.	Gadchiroli	Gadchiroli	Gadchiroli
16.	Armori	Armori	Armori
17.	Rajura	Rajura	Rajura
<i>IV. Service Centres</i>			
18.	Sironcha	Sironcha	Sironcha
19.	Chimur	Chimur	Warora
20.	Chamorshi	Chamorshi	Gadchiroli
21.	Nawagaon	Sindewahi	Brahmapuri
22.	Gondpipri	Gondpipri	Chandrapur
23.	Kurkheda	Kurkheda	Gadchiroli
24.	Dhanora	Dhanora	Gadchiroli
25.	Allpalli	Aheri	Sironcha
26.	Aheri	Aheri	Sironcha
27.	Yetapalli	Yetapalli	Sironcha
28.	Ghot	Chamorshi	Gadchiroli
29.	Talodhi	Chamorshi	Gadchiroli
30.	Madheli	Warora	Warora
31.	Pombhurna	Gondpipri	Chandrapur
32.	Nokewada	Rajura	Rajura

Continued

(1)	(2)	(3)	(4)
33. Rajoli		Mul	Chandrapur
34. Neri		Chimur	Warora
35. Dewada		Rajura	Rajura
36. Sahegaon		Bhadrawati (Bhandak)	Warora
37. Satgaon		Chimur	Warora
38. Kothari		Chandrapur	Chandrapur
39. Shankarpur		Chimur	Warora
40. Wirur		Rajura	Rajura
41. Majari		Bhadrawati	Warora
42. Asaralli		Sironcha	Sironcha
43. Saoli		Mul	Chandrapur
44. Nagri		Warora	Warora
45. Bimal		Mul	Chandrapur
46. Rampur Tukum		Gadchiroli	Gadchiroli
47. Adyal		Nagbhid	Brahmapuri
48. Arhar Nawargaon		Brahmapuri	Brahmapuri
49. Porla		Gadchiroli	Gadchiroli

V. Central Villages

50. Keljhar	Mul	Mul
51. Pathari	Sindewahi	Sindewahi
52. Bhis	Chimur	Warora
53. Chandan Keda	Bhadrawati	Warora
54. Gangalwadi	Brahmapuri	Brahmapuri
55. Tadoli	Chandrapur	Chandrapur
56. Khurja	Brahmapuri	Brahmapuri
57. Aipeth-Raitwari	Sironcha	Sironcha
58. Ankisa	Sironcha	Sironcha
59. Amirza	Armori	Armori
60. Mudza	Brahmapuri	Brahmapuri
61. Rajagad	Mul	Mul
62. Chiroli	Mul	Mul
63. Chandar	Rajura	Rajura
64. Byahad Bk.	Mul	Mul
65. Bhendola	Chamorshi	Gadchiroli
66. Bothali	Sindewahi	Brahmapuri
67. Nadgaon	Gondpipri	Chandrapur
68. Ankhoba	Chamorshi	Gadchiroli
69. Udupur	Brahmapuri	Brahmapuri
70. Chikani	Warora	Warora
71. Dongargaon	Warora	Warora
72. Visora	Armori	Gadchiroli
73. Wadhona	Nagbhid	Brahmapuri
74. Chirul	Mul	Chandrapur
75. Padoli	Chandrapur	Chandrapur
76. Whadhana Kd.	Warora	Warora
77. Mohali	Sindewahi	Brahmapuri

(1)	(2)	(3)	(4)
78. Sawari		Warora	Warora
79. Bori		Chamorshi	Gadchiroli
80. Sonurli		Rajura	Rajura
81. Chargaon		Warora	Warora
82. Sakharwahi		Chandrapur	Chandrapur
83. Awalgaon		Brahmapuri	Brahmapuri
84. Mindala		Nagbhid	Brahmapuri
85. Morwa		Chandrapur	Chandrapur
86. Waghala		Armori	Gadchiroli
87. Kunghada-Raitwari		Chamorshi	Gadchiroli
88. Antargaon		Sindewahi	Brahmapuri
89. Ladzara		Gondpipri	Chandrapur
90. Maroda		Mul	Chandrapur
91. Niphandra		Sindewahi	Brahmapuri
92. Nawagaon		Gondpipri	Chandrapur
93. Chincholi		Rajura	Rajura
94. Konsari		Chamorshi	Gadchiroli
95. Pimpalneri		Chimur	Warora
96. Masal Bk.		Chimur	Warora
97. Visapur		Chandrapur	Chandrapur
98. Sawargaon		Nagbhid	Brahmapuri
99. Chop		Armori	Gadchiroli
100. Murkhala		Chamorshi	Gadchiroli
101. Kampa		Nagbhid	Brahmapuri
102. Koregaon		Armori	Gadchiroli
103. Bhairamragad		Yetapalli	Sironcha
104. Vihirgaon		Rajura	Rajura
105. Govindpnr		Nagbhid	Brahmapuri
106. Ashta		Bhadrawati	Warora
107. Mohali-Mokasa		Nagbhid	Brahmapuri
108. Motegaon		Chimur	Warora
109. Durgapur		Chandrapur	Chandrapur
110. Mousi		Nagbhid	Brahmapuri
111. Wadholi		Gondpipri	Chandrapur
112. Mudholi		Bhadrawati	Warora
113. Salori		Warora	Warora
114. Nimgaon		Sindewahi	Brahmapuri
115. Kirmitti Mendha		Nagbhid	Brahmapuri
116. Londholi		Mul	Chandrapur
117. Moharli		Bhadrawati	Warora
118. Warur		Rajura	Rajura
119. Sawargaon		Chimur	Warora
120. Amgaon		Armori	Gadchiroli
121. Kamalpur		Aheri	Sironcha
122. Lakhanpur		Rajura	Rajura
123. Pardi		Nagbhid	Brahmapuri

Index

- Abujhmar Hills, 141
- Advance-deposit ratio, 91
- Agrarian Economy, 24
- Agricultural
 - Banking Division, 81
 - Development Branches, 81
 - Development, 2
 - Refinance Corporation, 78, 87
- Alkali, 14
- Area Development Programme, 171
- Backward
 - Areas, 1, 2, 6, 108
 - Districts, 2, 7
 - Regions, 2
 - and forward multiplier effects, 37
- Balanced regional development, 141
- Bailadilla
 - Iron Ore Project, 37
 - Hills, 12
- Barter system, 40, 41
- Black topping programme, 72
- Central Villages, 182
- Chattisgarh Plain, 3
- Comparative cost disadvantage, 2
- Contagious and soil-borne infections, 33
- Cross-sectional data, 8
- Darbar notification, 34
- Development planning, 2
- Differential fertility, 4
- Distribution transformers, 121
- District
 - Central Cooperative Bank, 78, 79, 81, 89, 93
 - Cooperative Land Development Bank, 78, 86, 89
 - Credit Plan, 96
- Double cropping, 31
- Eastern uplands, 45
- Economic development, 124
 - indicators of, 6
- Econometric model, 7, 8
- Elasticity of output, 154, 159
- Enduse method, 152
- Entrepreneurial skill, 2
- Explanatory variables, 150, 152
- Exogenous factors, 22
- External pressures, 6
- Fifth Five Year Plan, 96
- Fixed investment, 37
- Godavari-Sabri Lowlands, 12
- Groundwater potential, 10, 26, 135, 165
 - Survey and Development Agency, 55
- Growth Centres, 108, 134
 - Points, 134
- Hats, 41
- Immigration, 6
 - male, 6
 - non-tribal, 6
- Industrial
 - growth, 7
 - crops, 7
- Income population elasticity, 152
- Input coefficients, 9
- Integration of functions, 41
- Intensity of cropping, 30
- Intra-district movement pattern, 16
 - variations, 43
- International Development Association's Programme, 55
- Krishi Upaj Mandi, 172
- Kotri-Mahanadi Plain, 12
- Labour productivity, 21, 30

- Lateritic soils, 14
- Manikgarh State Forest, 47
- Market Centres, 134
- Market-oriented production structure, 30
- Marketable surplus, 40
- Mortality rates, 4
- Multi-purpose cooperative societies, 81
- Nistar, 35
- Normal development programmes, 123
- North-east Plateau sub-region, 3, 12
- Occupational structure, 22
- Optimum resource allocation, 132
- Orange area, 34
- Ordinary Backward (OB) Area, 108
- Past trend analysis, 152
- Perspective Plan, 2, 6, 155, 163
- Phosphorous, 14
- Planning Commission, 108
- Politico-economic process, 7
- Post Independence period, 10
- Predictive model, 9
- Primary Agricultural Cooperative Credit Society, 86
- Primary extractive sector, 37
- Productivity of land, 10
- Proletarianisation, 21
- Proposed reserved forests, 34
- Public sector, 6
- Rajura upland, 47
- Regional
 - development plan, 3
 - imbalances, 2
 - perspective plan, 3
- Regression analysis, 152, 157
 - equations, 9, 149
 - models, 8, 149
- Regulated market, 41
- Resource allocation, 7
- Revenue villages, 34
- Revised Minimum Needs Programme, 135
- Rolling Stock, 38
- Rural electrification
 - Corporation, 1, 99, 122
 - Programmes, 1, 2, 10, 12, 162, 169
 - Schemes, 1, 3, 8, 9, 121, 135, 136
- Rural Industrial Sector, 161
- Rural Industrialisation, 165
- Scarce factors, 134
- Semi-closed eco-system, 38
 - tribal, 125
- Service Centres, 181
- Sironcha lowland, 47
- Sixth Five Year Plan, 125, 159
- Spatial
 - distribution, 43
 - effectiveness, 142
 - remoteness, 142
- Special
 - Project Agriculture (SPA), 108
 - Industries (SPI), 108
- Specially backward areas, 2
- Specially underdeveloped (SU) Areas, 108
- Standard of education, 44
- Structural constraints, 124
- Surplus extraction, 41
- Survey of India, 27
- System Improvement Loan (SS), 108
- Target settlements, 139, 140
- Tikanpalli hills, 12
- Time-series profile, 9
- Transmission lines, 108, 135
- Tribal areas, 3
 - RMN, 171
 - economy, 41, 138
- Ubiquitous factors, 134
- Underdeveloped regions, 2
- Vicious circle, 43
- Vulnerable sections of the society, 2
- Wainganga lowland, 47
- Wardha lowland, 47
- Western upland, 46